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Camera Trails

By NORRIS W. HARKNESS

Care Is the Watchword

HAPPY New Year to you, and may 1943 bring you innumerable opportunities to make just the kind of Nature pictures you prefer!

This new year that is starting now is going to be difficult for photographers and the photographic industry. The material requirements of the armed forces will leave fewer films than we have had, eliminate flash bulbs for amateur work, remove many surfaces and sizes of paper, and cut down the supply of many items of equipment and chemicals. We shall have to learn to use substitutes for many of our regular materials and to use every scrap of material without waste. If we do make the most of what the authorities can permit us to use, there will be plenty for all ordinary work, although it may occasionally be necessary to wait for our dealer to receive new supplies. The important part we can play in the matter is to use our materials intelligently and thoughtfully while making each bit of film and paper go as far as possible.

This demands extreme care in every step of the photographic process, from the desire to make the picture straight through to the final mounting of the print. We shall have to think a bit longer before operating the shutter, and to make a definite decision as to whether this pose or that is best and whether or not we need to shoot both of them.

Fortunately, this thoughtful path can result only in better pictures. We are engaged in photography for the fun of making not just photographs but good pictures—Nature pictures, landscapes, portraits, record shots, or whatever kind we want, but good ones and not simply a larger number of poor ones. Since the chief difference between a good picture and a poor photograph is the result of thought and care that has gone into them, this enforced careful treatment is going to make better photographers of us and therefore make our cameras produce more fun, even though we may not be able to do as much picture work as we might like.

We shall have to look more carefully at backgrounds and study the play of light on our subjects as well as check focusing distances and exposures more accurately. We shall have to learn to wait for the perfect moment for the exposure when our subject's expression is exactly as we want it, and then shoot only after we are certain that every part of the picture-making, both mechanical and pictorial, is as nearly perfect as we can get it. We shall have to use filters thoughtfully and keep the lenshood in place and pay real attention to all the little things that make the big differences.

In the darkroom we shall have to use a familiar formula to develop the films and be even more careful than we used to be about the temperature of the developer, rinse, hypo and wash water. We shall have to wipe off surplus water carefully and hang the films to dry in clean moving air without too much heat. Then we shall have to file the negatives properly where they can be found readily and yet be adequately protected from humidity and mechanical damage.

In the printing we shall have to use test strips and make every effort to get the good print on the first full piece of paper. There can be no more "guess exposures" in the printing with their wasteful production of prints that are either terrible or only almost good. The good picture must be a good print and that means one that has been correctly exposed and correctly developed—not just run through with a guess and a prayer. Then they must be properly fixed in fresh hypo that reaches every inch of emulsion through sufficient movement of the prints in the tray and finally washed thoroughly in enough water to get rid of all the chemicals that would make the print fade if they remained in either the emulsion or the paper base.

REST PERIOD—A study by Mac Gramlich, who has learned the value of using a small part of a scene to show the idea behind all of it.

All of this is only the good common-sense method by which the best pictures always have been made so there cannot be much sacrifice in our turning to that method even though we are forced to do so. Call it looking for the silver lining if you wish, but then check the results you get by the more careful system and see if the enforced care has not made us work along lines that will continue to give us better results and therefore more fun from our cameras as long as we go on using them. We shall make the most of the days ahead if we make the best of them.

Special Note

The National Photo Awards of the American Red Cross, the nation-wide contest for pictures of Red Cross activities, and the spirit behind the organization, closes on December 31. The 122 prizes totaling $5125 in War Savings Bonds have been donated by the Photographic Society of America and its friends. Be sure to mail your entries in time to beat the deadline and write your name, address, and any caption or title on the back of each print. Mail them unmounted to the National Photo Awards, 298 Madison Avenue, New York City.

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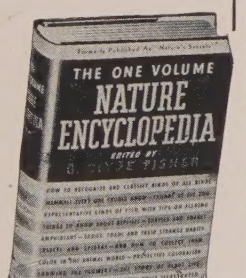

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J. O. M., Denver, Colorado, asks: "Does the dryness of the air here have anything to do with the fact that my films and papers seem to go stale and show signs of being light-struck sooner than they should even though they are never exposed to even the safelight for more than a few seconds at a time when I take them from the box? The paper goes worse than the films."

ANS.—Your difficulty is heat rather than dryness if your safelight is really safe. First, to test the light, place a piece of paper from a fresh package on your work table and put a number of coins on it in a line. With the safelight turned on normally, and everything as you regularly work, leave the coins for thirty seconds and then remove one. Thirty seconds later take away another and repeat the performance until five minutes have passed. Then develop the paper for normal time, fix it, and see if you can find where any of the coins lay. The number that show at all will indicate just how long your light is safe at that distance from the table. If no circles show, your trouble is either very stale paper or heat. The dry air is a real advantage in keeping sensitized emulsions fresh. I wish we had some of it in New York all through the summer months.

Kodaguides

The Kodaguides for Kodacolor, Kodachrome or black and white pictures are among the very best exposure helps—even better than a meter until you have mastered the meter technique. All you need to learn to use them well is what they mean by the different lighting groups like bright, cloudy bright, etc. The clear day is obvious, but if you will check the shadows, the other classes are just as distinct. A cloudy or overcast day that still shows clear shadows falls into the "hazy sun" group—excellent for color with either type of film—and when the shadows are faint and scarcely show at all, it is "cloudy bright", still good for color. A little work with the Kodaguides using black and white film as a basis for the experiment will show which kind of light you have and then you are set to do the best of color work.

Camera Trails is conducted for the help it may be to Nature photographers, and operates a question and answer service to aid you to solve your photographic problems.

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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

IN THIS ISSUE

January, 1943 ..... Vol. 36, No. 1

Cover Design ..... Rosalie Rees
Camera Trails ..... Norris W. Harkness 2
Contents Noted ..... R. W. W. 7
Let's Have Another Cup of Coffee—Uh! Uh! ..... Andrew S. Wing 9
Sassafras Tea ..... W. L. McAtee 14
Bombers from Brine ..... Eugene W. Nelson 15
The Land Crab of Florida ..... Hugo H. Schroder 18
Froglosophy (Poem) ..... Lake Barnes 18
Hands Off, and On ..... H. H. Sheldon 19
The Bovine Glamour Girl ..... Stuart Peabody 22
Living Things of Old ..... Carroll Lane Fenton and Mildred Adams Fenton 25
Brown Thrashers ..... A. C. Parsons 29
Silversword—Rare Jewel of an Hawaiian Crater ..... Sandford C. Smith 31
As We See It 33
Nature in Print ..... Howard Zahniser 34
People *Can* Live in Grass Houses ..... Margaret Whittemore 35
A Boy and Some Birds 38
Chickadee (Poem) ..... Orlo Evan Wheeler 38
Plant an Acre of Trees ..... Alf Z. Nelson 39
Today the Elm (Poem) ..... Isabel Williams 40
Fish Bites Bird ..... Victor B. Scheffer 41
Forest Magic (Poem) ..... Lenore E. Fisher 42
A Shot of a Lifetime ..... Frank Clodfelter 43
The Heavens in 1943 ..... Isabel M. Lewis 44
Thy Stars (Poem) ..... Winifred Waters Hubbell 45
The School Page ..... E. Laurence Palmer 46
Under the Microscope ..... Julian D. Corrington 54

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An appreciative audience of adults and children watch the showing of films by one of the British traveling cinemas that reach many whose homes and lives war has disrupted.

Films for Britain

From one end of wartime England to the other some sixty-five traveling cinemas carry films to soldiers and civilians, adults and children. They have proved of tremendous value in building morale, and the demand for films and for showings has increased rapidly.

The idea of helping came to Professor and Mrs. T. D. A. Cockerell, both famous naturalists of Boulder, Colorado, when they heard a radio broadcast by Princess Elizabeth in behalf of British children. They sent the young lady one of the Finley films showing the adventures of Peter, a naturalist's dog. In due course a letter came from Windsor Castle telling of the enjoyment that this film had given to many evacuated children from the bombed areas. Also came word of the need of such films for the traveling cinemas, and of the particular interest in Nature films.

This information was enough for the Cockerells, and they organized their personal British aid organization, purchasing and sending copies of motion pictures as funds permitted. The enthusiastic response and letters of appreciation were ample reward as well as striking indication of the need for such help.

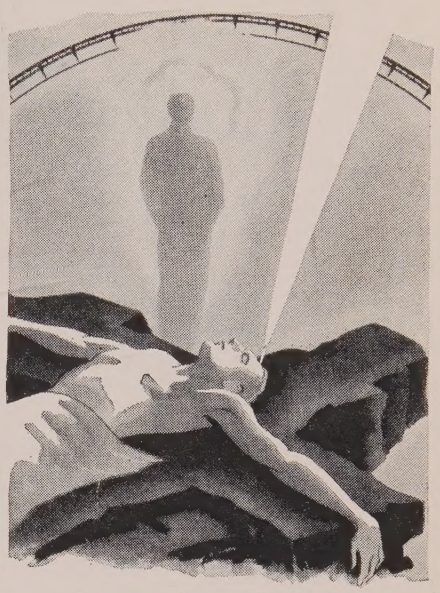
Among the films sent were copies of most of the American Nature Association's Finley Films. These were dispatched through official channels, usually by air, and some already have been shown a thousand times. But there is need for more during this coming winter.

The Cockerells suggested that among the readers of Nature Magazine and members of the American Nature Association, there may be those who would like to contribute to this work. We believe that there are. And to further it, the American Nature Association is glad to make these films available at absolute cost and to absorb all the expenses of handling and shipping them, as well as making its own contribution, where necessary, to make up a proper shipment. Anyone wishing to contribute may do so by sending their donation to "Films for Britain", American Nature Association, 1214 16th Street, Washington, D. C. No contribution will be too small. All funds received will be thrown into one sum for the purchase of the copies. Report on the progress of the project will be made from time to time in these pages, and we will be glad to answer questions.

Indiana Audubons

As always the *Indiana Audubon Year Book* of the Indiana Audubon Society is of interest to bird lovers, particularly in the Hoosier State. Among the features in the 1942 issue are further notes on birds in Indiana state parks; notes on the starling; and a key to the warblers in spring plumage. Membership in the Society costs one dollar a year, including the Year Book. Miss Margaret Umbach, 2526 East Drive, Fort Wayne, Indiana, is secretary.

A SPLIT SECOND IN ETERNITY



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Long Distance lines are loaded with urgent messages. Extra lines cannot be added because copper and other materials are needed for the war.

So — this Christmas please don't make any Long Distance calls to war-busy centers unless they're vital.

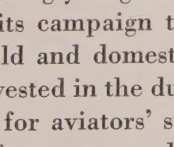
WAR CALLS COME FIRST

BELL TELEPHONE SYSTEM

Contents Noted

It has been our experience that most readers take pen in hand to call the editor's attention to some slip that has gotten by—such as ours some time back when we called a spider an insect. Much rarer are the letters of commendation, or in appreciation of an article or something good we have done with the magazine. Hence we trust we are being pardonably prideful by quoting a few of the spontaneous comments inspired by the changes effected with the November issue. "Your new cover is simply grand," writes a Chicago dentist. "I am crazy about the new set-up. It not only looks better but is easier to read," comments a Buffalo social worker. "The November issue with its lovely 'new dress' has just come to hand and I have enjoyed it throughout," says a Richmond fellow editor. "If you don't get the Pulitzer Prize for makeup you ought to! I think the new type and format is a really spectacular advance," writes a New York reader, on which high note we will stop, putting the many other comments into the "bouquet file".

However, before we become too inflated we must deal with one of those errors that got by. In the August-September issue, in Tom Wallace's article on stream pollution, we referred to "Representative Carl Mundt of North Dakota." Tom knew, and so did we, that Carl Mundt comes from South Dakota, but even seeing this geographical error in the printed proof struck no spark. A South Dakota reader, however, protested our giving Carl away to the neighbors to the north, who, we note, made no protest whatever. This apology to Carl and South Dakota is being written on election day, and we offer up a little silent prayer that the voters of his State are right now in the process of sending him back to Washington. His courage, sincerity and industry are needed on "the Hill". P. S. They did.

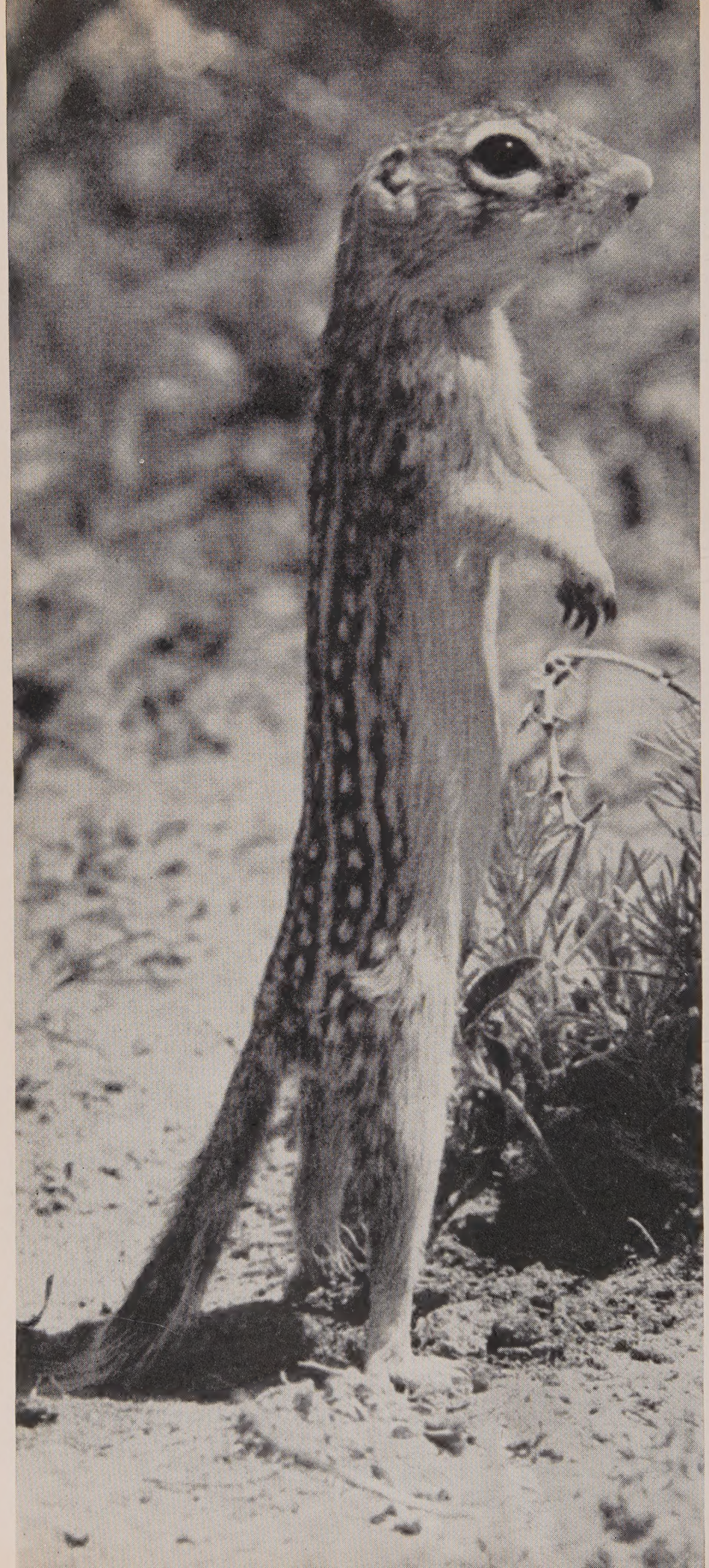


"Down will help to down our enemies" is the appropriate if not too amazingly original slogan of the Izaak Walton League in its campaign to salvage the body feathers of both wild and domestic ducks and geese shot as sport or harvested in the duck yard. This down is needed as lining for aviators' suits and other cold weather garments for our armed forces. It appears that WPB placed a priority on this type of feather way back last February. The League has established a shipping depot at 3227 South Shields Avenue, Chicago, to which the salvaged down may be sent. Send it to that address, marked Izaak Walton League—Feathers. Let's have no cold shivers interfering with our boys' trigger fingers. That's *our* slogan.

One of our colder outposts in this war, where some of the duck down garments will come in handy this winter, is Alaska. The boys up there are likely to develop a taste for reindeer meat before spring rolls around. A few small herds of these animals, brought from Siberia in the eighteen-nineties, increased to 350,000 head in twenty-five years, and have kept on ever since. Incidentally, about 2500 reindeer purchased by Canada and moved to the Mackenzie River delta region a few years ago have increased to 8000 head. Without robbing Santa Claus of his means of transportation, reindeer should provide a handy source of meat and a new test for Army cooks.

We have always wondered why the motion picture technicians have never been able to overcome the fact that the wheels of a vehicle moving forward appear to be turning backward. This, it appears, is stroboscopic action. Anyway, it is funny. We now learn that the Emerson Yorke Studio in New York seems in a fair way to have this licked. They have made a group of eight films on radial drill and shaper practice for educational purposes, and these show turning drills behaving as they should. It seems that it is all a matter of mathematics having to do with rotational speeds, camera shutter speeds, depth of lens focus and such. Thus far the formulas have been applied only in the studio and for location shots, and Mr. Yorke is not telling all his secret. It will be a relief when we can see a newsreel shot of the Hambeltonian sulky race in which the poor horses do not have to drag the spidery carts with the wheels frantically working against the striving steeds.

Speaking for the staff of NATURE MAGAZINE, may I wish you a Happy New Year, and a victorious one for the cause of all free men.—R. W.W.



A silent sentinel, the thirteen-lined ground squirrel stands in the attitude that has given to several of our species the popular name of picket-pin. At a distance, the general effect is that of an upright brownish object like a short stake on the prairie.

The earliest scientific name of this animal is *Spermophilus tridecemlineatus*, which translated means the thirteen-lined seed lover. In the past hundred-odd years it has gathered a sheaf of vernacular names that further reflect its gradual recognition by civilized man.

Somehow, this common animal seems to have escaped recognition by the expedition of Lewis and Clark, first to cross our plains, and it remained for Thomas Nuttall, officially a botanist but really an allround naturalist, to give it notice, for we read that in 1814 he sent specimens to Thomas Say, naturalist on Long's Expedition. Nuttall had found it abundant at the Mandan Villages on the Missouri in 1810. Neither Nuttall nor Say named it, and it was not until 1821 that it was formally described by Samuel Mitchill.

In allusion to our flag, this little animal with the thirteen stripes and many stars was called the Federation Squirrel, and also leopard spermophile, leopard marmot, striped and spotted ground squirrel, striped American marmot, and striped prairie squirrel. Also, various authors, trying to express their ideas of its relationships, have placed it under the genera *Sciurus* and *Marmota*, and now, sad to say, the good old name *Spermophilus* having been found untenable, it is called *Citellus*.

To make things worse, the people of the upper Mississippi Valley call his tribe gophers, a name properly applicable only to the pocket gopher, a plodding underground creature.

PHOTOGRAPH BY J. W. JACKSON

Let's Have Another Cup of Coffee — Uh! Uh!

By ANDREW S. WING

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WAR floods the spotlight on many things we ordinarily take for granted. Coffee is one. With ration books in hand, America's coffee drinkers now seek enough of the blend for a cup—and a whiff—a day. The aromatic bean has become front page news.

Actually there is nothing new in coffee being news. It has always been mixed up in trouble of one sort or another ever since it was banned by the Mohammedans. It has figured as the villain in many financial crises, and has had its part in building empires. Wars and political plots were hatched in coffee houses in London, Paris and Vienna. The American Revolution was plotted in coffee houses in Boston, New York and Philadelphia. And now coffee, America's leading table beverage, is all tangled up in another war.

First taken to the heart of mankind during the Dark Ages in the Near East, the use of coffee gradually spread to Western Europe, and, from there, all over the world. Attempts have been made to suppress it; taxes and tariffs have weighed it down; financial storms have raged around it. Still coffee reigns supreme in the Western World, and is second only to tea in the entire world. With the white peoples coffee ranks first. Innocent enough in its effects on the individual, it has certainly managed to be mixed up in plenty of scandal. Why is coffee such a turbulent brew?

The historical pattern of *Coffea arabica*, the principal coffee of commerce, parallels in many ways that of tea. Both are evergreen trees with a liking for a hot, moist climate; both produce their finest growths at high elevations in the Tropics; both are caffeine carriers; both started in Asia and came to us surrounded by an aura of myth and romanticism. International fortunes have been made from both coffee and tea, but it so happened that American soil proved best suited to coffee, while tea flourished best in the British and Dutch possessions of the Far East.

Coffee grew and still grows wild in Abyssinia, and from this native tree of the mountains of Abyssinia stem the several cultivated varieties that produce most of the coffee of commerce. There are species containing no caffeine and unpleasing in flavor.

The coffee tree grows to fifteen or more feet in height. It requires four years to come into bearing, after which it will continue to bear for at least forty years; sometimes even as long as a hundred years. Coffee is a beautiful plant, and when the white flowers open the fragrance is almost overpowering. Four months later the fruits—cherry-like drupes—turn from green to yellow and finally to a deep red. They are then picked by hand, put through a complicated process of hulling and drying and sent to market. That is the way it is now done on the large coffee plantations. But in the ancient coffee orchards of Arabia, whence comes the famous Mocha coffee, the work is done by much the same crude methods as a thousand years ago.

The old story has it that an Abyssinian goat-herd was the first to discover the virtues of coffee. He noticed one day that his shaggy flock was unusually playful. On closer observation he concluded that the antics were caused by the nibbling of the leaves and

berries of a certain kind of tree. The mystified herdsman told the abbot of the monastery where he worked that his goats were getting "drunk" on this fruit. The abbot's curiosity was aroused and he mixed up a brew of coffee and found that it was, indeed, delightfully stimulating. The other monks took up the new drink, glad of something to relieve the monotony of monastic living. They welcomed especially something non-alcoholic that might not be banned by their church. Gradually the custom spread. The Arabs, being a nomadic people, carried it back to their own land, whence it spread to Syria and Turkey.

We are told that it was an Arab who accidentally discovered that roasting improved the flavor of coffee. Both leaves and beans contain the alkaloid, caffeine, but it is the essential oils and other substances in the roasted bean that make it a palatable drink. The storied Arab accidentally dropped some coffee beans in the camp fire, but fished them out and put them in the pot. The flavor, he found, was delicious, and soon his fellow Arabs were roasting their coffee in pans held over the fire, just as they do to this day. After enough coffee is roasted for a sitting, it is ground by a mortar and pestle and put in a pot over which boiling water is poured. This is a crude but effective way to make a good cup of coffee, we are told by people who have traveled widely in the Near East.

The Arabs, being good Mohammedans, to whom all wines and other alcoholic drinks were forbidden by the *Koran,* found in coffee the cup that cheers. After a long hot trip over the desert it added much conviviality to their tribal gatherings as they nestled at night in their snugly cushioned tents, with cold, dusty winds whining outside. Coffee was, indeed, a boon to the Bedouins and other desert tribes. They imported the plants and grew them on carefully terraced hillsides. Eventually, as the fame of coffee spread, the Arabs developed it into a highly profitable adjunct to their business of raising sheep, goats and Arabian horses.

But the hold that coffee was getting on the followers of Allah alarmed the high priests of the Mohammedan faith. Coffee was too stimulating, they thought, thus violating the law against drunkenness. Many other charges were brought against it in a church trial that makes amusing reading today. The defenders of coffee were eloquent and clever, but the church won hands down. The brew was banned to Mohammedans under penalty of death. But that did not stop the sons of Allah from drinking coffee, and eventually the ban was removed.

Travelers from European countries brought back news of coffee, variously called *kahwa, chaube, chaoua, cauphe* and *coffa,* but it was not actually introduced into Europe until the seventeenth century. It aroused great interest, even among the clergy, and was considered by many to be a medicine as well as an interesting beverage.

Pope Clement VIII smacked his lips over his first cup and is said to have exclaimed, "Why, this Satan's drink is so delicious that it would be a pity to let the infidels have the exclusive use of it. We shall fool Satan by baptizing it and making it a truly Christian beverage." And to this day coffee is *the* drink in most Catholic countries. In fact, social history reveals that it has had a sobering effect on a number of nations whose people were inclined to tipple—especially the English.

When coffee reached England—by way of France—about 1657, the British were the hardest drinkers the

In bloom, the coffee tree is a beautiful plant, and its white flowers, when open, give off a fragrance that is almost overpowering in its pungence.

PHOTOGRAPH FROM GENDREAU

world has ever known. The stormy Restoration Period gave everyone plenty to worry about, be he rich or poor. Manners were fine; morals were low; alcohol was king. Sometimes to celebrate, but more often to drown their sorrows, too many Englishmen of those days opened their eyes with a mug of ale, kept at the mug or bottle all day long, and fell into bed, if they were lucky enough to find it, in a drunken stupor. The wives often did their best to keep up with their husbands, and sometimes succeeded.

Coffee sobered to a point where the brewers became really worried and tried to legislate it out of existence. First it was a drink of fashion, but as fast as they could afford it the masses took it up. From 1660 to 1730 coffee was supreme in the tight little isle. Coffee houses sprang up like mushrooms overnight and some of them remain to this day. One of these was Lloyds, center of marine intelligence and still the leading insurance company of the world. Coffee-house habitués included such brilliant literary figures as Dryden, Congreve, Addison, Pope, Swift, Johnson and his Boswell, and Samuel Pepys, the diarist. Coffee stimulated conversation, ideas, trade and political discussion. The rulers of the day were as disturbed as the brewers about the coffee houses. This new custom of forsaking the vinous cup to sip coffee made people think. It made them politically restless. But attempts to suppress the coffee habit invariably failed. The best that could be accomplished was to tax it heavily, thus making it, along with tea, a handsome source of revenue.

Then tea came along and stole the show. After half a century of devotion to the "wine of Islam", the English switched to tea and have been tea drinkers ever since—just why no one seems to know. Jacobs in his colorful book, *Coffee—The Epic of a Commodity*, suggests that coffee made the British too talkative and disputatious. "Tea," he says, "promotes quietude . . . a beverage for taciturn people, therefore better suited to the English." Whatever the reason, the English switched to tea while the French, Dutch, Italians, Germans and Scandinavians remained faithful to coffee.

American colonists were heavy tea drinkers until the Revolution, then dropped the habit, and we have remained coffee drinkers. We normally consume yearly some fifteen pounds of coffee per capita compared with less than a pound of tea. Thus a ration of a pound a month represents a real cut. Until the war curtailed supplies the consumption of both tea and coffee was mounting slightly, thanks to skillful advertising. It is yet too early to tell which way the pendulum will swing after this war. Both tea and coffee are consumed heavily by the armed forces, and some of our boys who are serving in tea-drinking countries may be won over. But the American temperament seems to demand coffee. Furthermore we have strong economic ties with Brazil, Colombia, Mexico and other coffee-producing countries in this hemisphere. The English, on the other hand, have heavy economic stakes in India and Ceylon—tea-producing countries. The Dutch, who are interested in East Indian countries that produce both coffee and tea, are coffee drinkers.

The Dutch got into the coffee trade as soon as they saw its commercial possibilities. They planted it in Java, a favorable soil and climate being available there, where they could control its production and export. Java coffee soon became a rival for the famous Mocha of Arabia. As the demand for coffee grew, other countries took up its culture. Finally it landed in

Four months after blooming the "cherries" of the coffee tree turn from green to yellow and then to deep red and are ready for picking.

PHOTOGRAPH FROM GENDREAU

NATIONAL COFFEE DEPARTMENT OF BRAZIL

To the horizon, and beyond, row upon row of coffee trees grow in this Brazilian fazenda in a country that has proved most suitable for the production of the aromatic bean. Brazil, in fact, produces two thirds of the world's supply, and the United States normally consumes one half of the Brazilian output.

Brazil during the early part of the eighteenth century, being smuggled in by way of the West Indies. There—in the State of São Paulo especially—the coffee tree became a gold mine, at least for a time.

Coffee figures are astronomical, but if we remember that Brazil produces two-thirds of the world crop, and that the United States consumes half the world crop of around 1,500,000,000 pounds a year, we can see its importance. That makes us Brazil's best customer, which no doubt has a bearing on the fact that Brazil is one of our staunchest allies in Latin America, while Argentina, a trade rival, is still officially a neutral. Next after Brazil as coffee producers are Colombia, El Salvador, Venezuela, Guatemala, Mexico and other Central American countries. Cuba and Haiti produce coffee also. Hawaii and Puerto Rico, our only possessions that grow coffee, turn out a grade that commands a good price, but the production is small.

American coffees are classified by the trade as "Brazils" and "Milds". The Milds are grown in the mountainous countries and are used for blending with the full-bodied Santos and Rio coffees of Brazil. No Brazilian, least of all a coffee merchant, will admit that any other coffee is superior to those of his own land, but the fact remains that the Milds generally command a higher price.

Coffee blends are trade secrets, but it is generally true that the popular advertised brands run about sixty percent Brazils and forty percent Milds. However, many people prefer a straight Brazil coffee of better quality. It all depends on the taste.

The point of origin, however, is only one of the many factors that determine the quality and flavor of a coffee. The rich, chocolate-brown, volcanic soil of the São Paulo plateau has produced prodigious crops of coffee for a hundred years, but the higher mountain *fazendas* often produce growths of finer flavor but smaller yields. The season has much to do with it, too, as coffee is as subject to the whims of weather as any other perishable crop. Nor can the planter be ignored. The care he gives his coffee trees, and particularly the way the crop is handled after it is picked, all enter into its quality.

In Brazil the coffee industry is highly industrialized. Labor gets from $1 to $1.50 a day and must be abundant, but all the work that can be done with machines is so performed. This includes washing the fruits, fermenting off the flesh, breaking the parchment that holds the two seeds or "beans" together, sorting and cleaning. But the picking and the drying in huge open-air drying yards must be done by hand labor. The fortunes and much of the colorful political history of Brazil are closely wrapped up in the epic of this brown bean. Brazil is so large and so varied in its character that, while wages are fairly good in the more prosperous sections, in other more remote regions they are still so low that the workers cannot even afford coffee.

War and geography enter largely into this. Germany

and the occupied countries of Europe are doing without coffee, except for the substitutes made from cereals, dandelion roots, and even stock turnips. Chicory they do not much mind, being used to that in their coffee, as we are. We, of course, have run short on coffee because of a lack of shipping caused by submarine warfare and demand for ships for transport use for other purposes and in the other parts of the world. Two cups of coffee three times a day, a habit with many, is definitely out for the duration. This hurts the coffee merchants, who had carefully fostered the habit, but they would rather have people use less than to become accustomed to substitutes. Already we hear of cereals and chick peas being used as adulterants. Chicory is not bad either, as it has a flavor of its own. It is an American-grown product and it will probably come into more general use.

Coffee producers, importers, jobbers, roasters and distributors have struggled against great odds to keep up the supply and the quality of their product. If your coffee tastes different, a little weaker perhaps, the chances are that the blend of your favorite brand has been slightly changed because of the situation. But one can be reasonably sure that if it is one of the leading brands there has been no deliberate deterioration of the product. If your ration ticket yields what seems to you an inadequate amount, think of the boys in the service who need it more than you do. Try making your coffee a little stronger and using a little less—a small cup of strong coffee, slowly sipped, is more satisfying than a large cup of "slops".

There is no secret to making good coffee. Follow directions for your kind of coffee maker. Keep your utensils scoured bright. The oil that gives coffee its flavor becomes rancid in time. So clean out the container in which the coffee is kept—do not mix the crumbs of stale coffee with the new. Coffee will keep a year or more in storage before it is roasted and ground. But it deteriorates rapidly after being ground, even in an air-tight container. It will keep for two weeks, or more, but not for months. Hoarders of coffee who tried to beat the ration deadline will therefore find themselves with a rancid product on their hands.

Coffee is harmless to the majority of people if used in moderation. The alkaloid that gives coffee its stimulating quality, but not its flavor, is caffeine, the chemical name for which is *trimethyldioxypurin*. Pure caffeine is used in medicine as a drug. Coffee contains from one and five-tenths to two percent caffeine. It is of course exactly the same chemical that is found in tea, cocoa, maté, and cola. Coffee has no food value, except for the milk, cream or sugar used in it. There are a few people who are allergic to coffee. But it is not only a pleasing beverage but a valuable aid to most of those who must endure long stretches of mental or physical labor. It adds greatly to the gaiety of living. To most Americans, coffee is *the* indispensable item on the breakfast table, and a poor cup of coffee has sent many a husband off to work in an ill humor.

Is coffee an artificial taste? Probably so, but it has been suggested that caffeine is similar in formula to a vital substance found in the blood stream. Whatever it is, coffee has certainly gone a long way since it left its home in the Ethiopian hills hundreds of years ago.

The coffee industry in Brazil is highly industrialized, and as much of the work as can be done by machines is so performed. The picking and the drying in huge, open-air drying yards are of necessity done by hand labor. Below, workers in a São Paulo drying yard stir the beans as though they were shoveling off snow.

NATIONAL COFFEE DEPARTMENT OF BRAZIL

Sassafras Tea

By W. L. McATEE

Illustrated by Lawrence D. Conway

THERE *is* a connection between sassafras and chimney sweeps. Be patient.

A hundred years ago there were still chimney sweeps, at least in England. Whether these adventurous elves ever flourished in our country, I do not know, but surely they could not traverse such narrow and becapped house chimneys as we have today. Even were all chimneys those of fireplaces, as of old, with throats the roomiest imaginable, going through them to remove furrings of soot is not a job one would covet. Well could the slender lads, who did most of the sweeping, crave something to relieve them of the stuffiness caused by breathing the soot-laden air.

This something existed in the London of his day, according to Charles Lamb, in "a composition, the ground-work of which I have understood to be the sweet wood 'yclept sassafras. This root boiled down to a kind of tea, and tempered with an infusion of milk and sugar, hath to some tastes a delicacy beyond the China luxury." This composition, says Elia, "is surprisingly gratifying to the palate of a young chimney-sweeper." It is as if "Nature, sensible that she had mingled too much of the bitter wood in the lot of these raw victims, caused to grow out of the earth her sassafras for a sweet lenitive—but so it is, that no possible taste or odour to the senses of a young chimney-sweeper can convey a delicate excitement comparable to this mixture." They will hang their heads over the ascending steam, Lamb concludes, seemingly no less pleased than cats when they purr over a new-found sprig of valerian. "There is something more in these sympathies than philosophy can inculcate."

Yet it is well to consult a philosophy, that of medicine. There we find sassafras, the basis of the fragrant salop, classed as a demulcent. Going to the dictionary for this strange word, we find that it means "capable of soothing inflamed mucous membrane or of protecting it from irritation." So it was just what the chimney sweeps needed to clear their breathing after their exertions amid the soot. Sucking the savory steam through wide-open nostrils and throat, they doubtless thought, what in that posture they could not have said, "Ah! good old salop."

Regardless of the chimney sweeper's gusto for the brew, Lamb stipulates, "for myself . . . I have never yet adventured my own particular lip in a basin of his commended ingredients—a cautious premonition to the olfactories constantly whispering to me, that my stomach must infallibly, with all due courtesy, decline it."

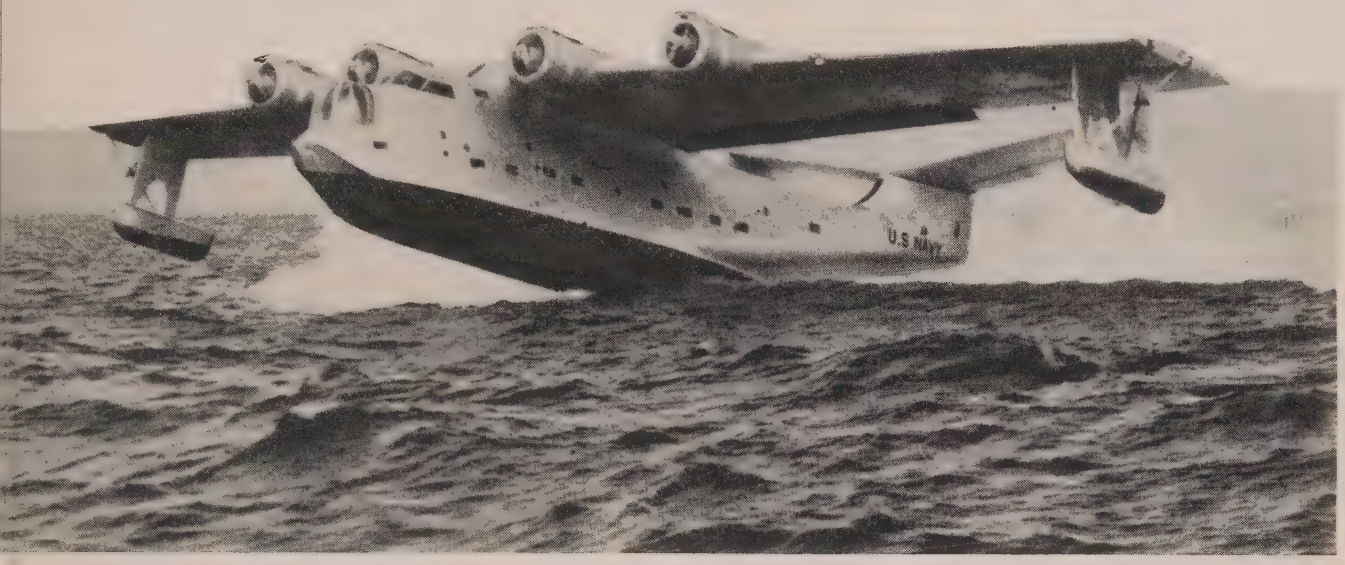
In other words, he did not even try it and maybe he was right. His description, "boiled down", suggests a medicine rather than a drink. As a medicine, sassafras "tea" has been much used in America. Our forefathers got most of their remedies from the woods and one of them—taken in spring to "thin the blood"—was a decoction of sassafras. Decoction, word of the drug shop, means something prepared by cooking, that is, boiling, and that treatment extracts from sassafras its puckery tannin and its pungent aromatic oil in strengths too great for enjoyment. When the time came to take the stuff, we gulped it down or had our noses held to insure quick swallowing, shuddered, and thankfully thought or said, "There, that's over with." Hence many an adult, at the mention of sassafras tea, exclaims, "Do you drink that stuff? I had enough of it long ago."

But there are teas and teas; in fact the use of the name should be denied to the biting, bitter products of boiling. A genuine tea is an infusion, not a decoction. It should be an extrac- (Continued on page 52)

With magnesium, the mermaid metal and the lightweight champion, we make—

Bombers from Brine

By EUGENE W. NELSON



U. S. NAVY PHOTOGRAPH

Today the major use of magnesium and its alloys is to make fighters and bombers lighter and faster, but when victory is won magnesium will serve a wide variety of peacetime economic purposes, and engineers foresee a great future for this lightweight champion in the metal class.

Not so many years ago, aluminum was generally considered to be the lightweight king of all the metals. Many people still think of it as on his throne. However, aluminum has lost its title to a forgotten metal—magnesium, the metal that is part mermaid. Of course, aluminum is still very important, and it will become increasingly so as time passes. Still, a cubic foot of aluminum weighs 175 pounds, while the same amount of magnesium tips the scales at 112 pounds. This weight advantage, together with magnesium's strength, has made it the new lightweight champion of all the *structural metals*—metals that are used to actually build things such as airplanes and automobiles.

Magnesium is truly a metal of today. Its earlier history can be told in a few words, even though Sir Humphrey Davy *did* discover this element back in 1808. The famous English chemist wrote in his notes at the time that magnesium was a "light and pretty metal", obtainable without too much effort from a large number of minerals. It has since been proved that magnesium really *is* very plentiful. It is the eighth most common element in the world, making up fully two percent of our globe's crust. But getting the pure metal away from its ores on a commercial basis is quite another story, and a stern challenge to metallurgy.

Some metallic magnesium was actually produced in France in 1830, but it was a long time before it became anything more than an expensive curiosity. Its first commercial service was rendered as an ingredient in the manufacture of fireworks, as a flashlight powder for night photography, and in making star shells and signal flares. Then, in the early 1900's, Germany began to produce magnesium on a real commercial basis and started to experiment with its use. About 1915 America followed suit, and has been trying to catch up to Germany ever since. Naturally, exact figures on the production of magnesium metal are hard to get out of Germany, but the feeling among our metallurgists now is that if we have not already surpassed that country's output, we soon will, and will continue to forge ahead rapidly.

If magnesium is a plentiful element, it is also an extremely *sociable* one. The pure metal is never found alone. So, before it can be used, magnesium has to be separated from its friends. At first, this separation process was so costly that many scientists believed magnesium could never be used on a large scale. But American engineers—working independently of any German techniques—have finally turned the trick and now magnesium is fairly cheap.

There are plants in both Michigan and Texas where

PHOTOGRAPH FROM THE DOW CHEMICAL CO.

A pile of sand-cast aircraft landing wheel hubs. Note how easily these can be handled.

magnesium metal is being produced on a large scale. The Michigan establishment takes magnesium compounds out of the salt brine that is pumped up from deep wells. It is a somewhat different process from mining solid ores and then refining them with heat in blast furnaces. This brine—richer in many dissolved mineral substances than is ordinary sea water—lies in natural reservoirs deep under the rolling countryside of central Michigan. Here, right between two of the world's largest fresh water lakes—Huron and Michigan—is a vast supply of salt water! After this brine has been pumped to the surface of the ground, the pure metal is extracted from it by the "electrolysis" method. In the words of one engineer, the electrolysis process means that the brine is "kicked around chemically and then squeezed electrically."

Our other magnesium-producing plant is at Freeport, Texas. At this plant, magnesium is extracted from ordinary ocean salt water—so the metal is really part mermaid. The Freeport process is most interesting because it is one of science's first attempts to recover the wealth that for centuries men have known to exist in the sea. Engineers calculate that there are nearly six million tons of pure magnesium metal in every cubic mile of ocean water. Since these are rather large figures even for a time when financial budgets seem to be worked out by astronomers, just figure that a bath tub full of sea water will give up a quarter-pound of magnesium metal if properly treated.

At the Texas plant, eight hundred tons of sea water are treated to get *one* ton of magnesium. In theory, the plan requires only three steps. First, the sea water is mixed with limewater. The lime changes the soluble magnesium salts into the familiar milk of magnesia. Hydrochloric acid is then mixed with this milk of magnesia, producing magnesium chloride. An electrical current then drives the chlorine gas from this compound, leaving the pure molten magnesium metal, which is then cast into ingots for further use.

In actual practice the trick is to perform all of these steps on an economical basis. The solid ores of magnesium, like magnesite, contain as much as twenty-four percent of the valuable element. Contrast this with sea water, which holds only one-tenth of one percent of magnesium, together with all sorts of impurities that must be sorted out and separated from the magnesium. Making such "low-grade ore" pay its way takes fantastic amounts of other materials.

For instance, the intake pumps at the sea water inlet handle three hundred million gallons of water every twenty-four hours. Oyster shells, dredged from Galveston Bay near Freeport, are converted by the carload into slaked lime in a kiln 300 feet long. The tanks for holding the lime and the milk of magnesia are respectively 150 feet and 200 feet in diameter. The plant is built on a 2000-acre peninsula in Freeport Harbor. Work was started in March, 1940, and ten months later the first ingot of metallic magnesium was poured. This was the first solid metal ever made from sea water!

The Freeport plant was originally designed to produce some eighteen million pounds of magnesium a year. But before the construction of the plant was even started, the builders were "asked" by the government to double this capacity. And then, before construction was completed, another request was received, again asking that the capacity be doubled! To appreciate what this means in terms of amount of metal that engineers and designers expect to use, let us look at a few figures. In 1920, American industries produced

and used about 300,000 pounds of magnesium metal. Last year they made 54,000,000 pounds; this year they will need 125,000,000 pounds—perhaps more. Eventually, the plants now in operation or being constructed are expected to turn out something like 400,000,000 pounds of this silvery metal every year. No other metal has ever reached such dizzy heights so quickly.

Now let us take a quick look at the metal itself. Magnesium owes its present importance to its hot temper and its lightness of spirit. Powdered magnesium metal catches fire almost as easily as gasoline and burns with a blinding white flame. This makes it useful in making various products, the one most widely in the minds of thousands of air raid wardens today being the incendiary bomb. In solid form—such as sheets and bars—you can not set fire to magnesium even with a blow torch! It is also very easy to work in the machine shop. You can weld sheets of magnesium metal and its alloys together with a blow torch. You can rivet pieces of it quite easily. And a sharp machine tool—a lathe tool or a milling machine cutter—cuts this metal like butter. In fact, magnesium can be machined at the highest speeds attainable on the equipment now available to mechanics.

The lightness of magnesium is shown by the ease with which this workman handles two ingots of the metal.

PHOTOGRAPH FROM THE DOW CHEMICAL CO.

The property of magnesium that is of primary interest to industry—and especially to the transportation industry where every effort is made to reduce "dead weight" and increase "pay load"—is its amazingly light weight. It has a specific gravity of 1.74, which is about thirty per cent less than that of aluminum. Thus 180 pounds of magnesium will do the work of 270 pounds of aluminum alloy in an airplane engine, saving 90 pounds. In a four-motor bomber, this means a weight-saving of 360 pounds. Such a figure represents the weight of two men in the bomber's crew; or 360 pounds more of bombs; or an extra barrel of high-test gasoline so the plane can fly farther and still get back home safely. At the moment, in spite of all the technical improvements in methods of extracting magnesium, the metal is still too expensive to be used on a large scale for much except airplane motors. However, engineers assure us that it will not be long before magnesium and its various alloys will be saving weight by being used for wing coverings, in fuselages, and other parts of aircraft. Then, indeed, we will have wings from the sea—bombers from the brine!

When at last our present need for magnesium and its alloys to make airplanes lighter and faster is over, engineers see an even greater future for the new lightweight champion. The transportation industry can then take advantage of magnesium's properties in a big way. It will be used really to streamline automobiles, trucks, busses, and trains. It will then be cheap enough so that it can perform household duties, as well. It will make the baby carriage so light that the buggy can be carried up the front steps of the house—with the baby still in it! Magnesium alloys will also be used to produce big, sturdy pots and pans so light that you will be able to lift them with one hand. And magnesium will also be used to make pianos so light that you can move them about when sweeping the room!

In fact, this metal, almost as light as wood yet fully as strong as plain iron, is going to play an important part in our lives and in our economy in the near future.

★

Snowflakes

By ETHEL ROMIG FULLER

Each lovelier than the other;
Each different from the last;
White and soft as lamb's wool
Where they are windy-massed.

Times, after thaw, congealing,
They glace drifts with crust
That sparkles in the moonlight
Like powdered diamond dust.

Do they once melt, they're salvaged
In clouds, and there recast,
Each lovelier than the other;
Each different from the last.

This shore-going crab of Florida goes to sea to deposit its eggs but passes the rest of its life on land.

The Land Crab of Florida

By HUGO H. SCHRODER

A RUSTLING noise attracted my attention to a dry palmetto leaf lying on the ground. Moving rapidly across the large palm frond was a many-legged creature with a rounded body. This was my first glimpse of the strange land crab of the lower Florida east coast. I wanted to get a better look at the big fellow so I picked up a stick and held it near the crab's huge nipper. He promptly grabbed the stick, permitting me to note the curious characteristics of this land crab, *Cardisoma.*

During the following months I frequently encountered these crabs as they wandered about in the coastal regions. Ordinarily they made haste to get out of the way, but if I cornered one, the ugly-looking creature was always ready to defend himself. And he could have made me painfully aware of his nipping powers, if I had been foolish enough to give him an opportunity to catch hold of a finger. When I backed a crab against a clump of grass or some other barrier, he would wave his huge claw menacingly, open and close the ugly mouth and change the position of the stalked eyes from time to time. Land crabs can truly raise and lower their sights, for the hinged eyes may be dropped into the sockets or elevated, as needed.

Most crabs live in the sea or along shore; some forms reside in brackish marshes along the coast. Land crabs go to the sea to deposit their eggs, but after the young leave the salt water, they live on land, except for the periodical egg-laying excursions. At such times they travel in company with many others of their kind. They are said to be quite destructive to various forms of plant life wherever they are particularly numerous.

★

Froglosophy

By LAKE BARNES

"There are such wondrous forms of life,"
Said Homo Sapiens to his wife,
"If we were frogs and Man was never,
We still would call our Maker clever."

The best slogan for treating the creatures of the wild is—

Hands Off, and On

By H. H. SHELDON

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Some sort of a secret of the outdoors is being told by the fawn to the attentive dog friend. One guess is as good as another as to just what it may be.

INSTINCT is a wonderful thing in the wilds. When it gets complicated by man's "obey-that-impulse" creed, tragedy may result.

A week-old fawn curled into a spotted ball under a sheaf of bracken is a sight few can resist. The first impulse is to feel it in your arms. Once you have picked it up you begin to excuse your possessiveness. You assure yourself that it is lost. You even contrive to feel noble when you take it home to raise.

Actually, the hiding fawn is obeying instinct—its own and its mother's. Not one fawn in a hundred is ever permanently separated from its mother. She knows that it gives off no scent, and that if it stays quietly where she has left it hidden, no predatory animal is likely to find it. She has to go away to eat and drink. She will come back. And she will give it the care you cannot, unless you have been thoughtless enough to touch it. The odor of a human hand is pungent. It frightens a deer. Occasionally a doe refuses to accept her fawn if it smells of man.

When you stumble upon a fawn in the woods, do not touch it. Get out of that vicinity as quickly as you can, because the doe will not come back to her fawn until your scent has faded from the neighborhood.

Once in a while some accident orphans a fawn. The mother is killed, or the fawn gets into some difficulty that necessitates man's intervention. If this should happen, here are some facts you will not find in any natural history book for, so far as I know, no other naturalist has stumbled upon them. Lack of this information may account for the difficulty experienced by zoos in attempting to raise orphaned animals.

For the first two weeks of a fawn's life its eliminative processes, both bowel and kidney, function only at the instance of the mother. While the fawn nurses, its mother licks its nether end. This external stimulus is essential to function. I made and verified this startling discovery a few years ago when a rancher friend brought me a three- or four-day-old fawn that he had been obliged to rescue from dogs that had killed the mother.

When the fawn was brought to me, it was definitely known that for forty-eight hours she had not eaten, nor had her kidneys or intestines functioned. I was able to induce the fawn to take, from a bottle equipped with a lamb's nipple, a mixture of cream and water. The stoppage of digestive processes had me worried. I felt sure that I could stimulate one process with mineral oil. The kidney stoppage was the serious one, and already the fawn was dry-nosed and feverish.

It was probably sheer inspiration that made me recall the constant licking of offspring indulged in by mother cats and dogs, and to associate this recollection with a sight I had witnessed and photographed—a nursing fawn and a licking mother.

Two hours later, when I gave the fawn its next bottle,

An intimate moment between mother deer and her fawn. This may often have been observed by those who are accustomed to watch the actions of wild creatures. Its real meaning did not, however, dawn upon the author until he became the foster parent of a fawn and confronted with all the responsibilities of parenthood.

I took along a soft cloth wrung out in warm water and, as the little creature sucked the bottle, I massaged its rear end with the warm cloth. It functioned instantly and normally. Careful watching established the fact that for ten days thereafter this fawn never functioned except under the external stimulus of the massage. When she reached the age of two weeks, she took over the functions herself with complete normality.

Another important factor in raising a wild animal is that of food. A very young fawn has little stamina in captivity and will die quickly under wrong feeding. Straight cow's milk is taboo. A mixture of half cream and half water may agree with some young wild animals. But, for the fawn, the substitute nearest its mother's milk, the one food upon which it will flourish, is goat's milk. A young fawn eats little and often. I fed mine two ounces every two hours, gradually increasing the amount and the feeding intervals until at the end of three months she was taking a pint of goat's milk three times a day, in addition to rolled oats, sheep nibs, clover hay and currant bushes. She had rock salt and plenty of fresh water always at hand, and liked to play in the water as well as to drink it. Deer are browsers. They like most shrubs—ceanothus (buck brush), manzanita, currant and raspberry bushes, and even aspen saplings. My deer was especially fond of fruit, but I made sure that any that I gave her was thoroughly ripe. The next time you visit a zoo, take along a bag of sweet water grapes if you want to make a hit with the deer.

Any domestic diet is apt to be lacking in some natural element that the deer will find for itself in the wilds. As a substitute for special spring yearning toward buds and berries, I discovered that the deer would take a tablespoonful of fresh cod-liver oil once a day. She did not like it, but she licked it up volun-

Mealtime finds a hungry fawn whose stiffly erect tail indicates the joy of eating. The youngster is sucking so hard on the nipple that the bottle must be held firmly to prevent its following the milk into the eager fawn's tummy. Goat's milk proved to be the food on which the orphan flourished. Straight cow's milk did not do.

arily, shaking her head and stamping her feet between licks. She even drank a small bowl full of mineral oil at the time when she had her only bout with constipation. Apparently she knew she needed it.

Some fawns grow thoroughly accustomed to "civilized" noises. Others, especially those that do not lose their wild instincts readily, are thrown into a panic by any unusual and disturbing sound. When frightened, they will run, tongue hanging, until they are exhausted. If you have gained the animal's confidence, and have it in an enclosure, your presence and a little talk and petting will bring it back to normal.

Then, without notice, you will wake up one morning to discover that you have on your hands a fine, mature, handsome deer. You will see this animal as a prisoner in the concentration camp of your yard. You will read in her beautiful uplifted head and soft, longing eyes the tragedy of having cut her off from her own kind. You will understand that she is in her first, strong prime without a mate, with no freedom, and no purpose. It is at this moment that you realize what it means to take into captivity one of these creatures of the wild. To free her now, after the soft, hand-fed protection you have given her, is to submit her to painful adjustments and, quite possibly, to the fangs of the predators. In many parts of our country, of course, any danger from wolf or cougar is no longer existent. But always there is a likelihood of danger from hunter or inexperienced tourist. Many a deer whose only remembered human associations meant nothing but kind treatment has met death in the woods from misplaced confidence in mankind. Whatever you do now, it is likely to hurt—hurt both you and the fawn.

Next time you see a lone fawn in the woods, put your hands in your pockets and run for deer life.

Elsie's boudoir at the New York World's Fair was tastefully furnished with appropriate barnyard touches such as the wheelbarrow chaise-longue.

Because people love animals, they turned paper, words and plaster into—

The Bovine Glamour Girl

By STUART PEABODY

For three years and seven months after her creation Elsie was an inanimate creature compounded of words, printer's ink, paper and plaster. In short, she started life as an advertising idea, but, because the public likes animals—and likes them alive—she became a live *public* character.

Elsie was conceived, after much deliberation and strictly businesslike calculation, as spokesman for a great dairy company, which shall be nameless in this paragraph only. You know which one I mean, anyway. Yet, in those early days, she showed all the signs of a great personality in the making.

A chance at the "big time" was offered her by the promoters of the New York World's Fair. The Borden Company decided to show to expected millions all the elaborate care and sanitation surrounding the production of milk and its products.

A fine herd of 150 pure-bred cows was collected—approximately equal numbers of Holsteins, Ayrshires, Brown Swiss, Guernseys and Jerseys. Facilities for milking were provided and a splendid educational exhibit devised. Live animals were said to be a sure draw at any fair. However, other worthy educational efforts had suffered unkind fates because they were too lofty in concept and execution.

Elsie, however, in her advertising settings, had never been serious. She had romped her way through the newspapers and magazines and on the air. Those who had seen her had laughed with her and liked her. She seemed certain to add the necessary humorous, friendly touch to a highly educational project. So the exhibit was literally infested with her. A large plaster statue of the bovine protagonist occupied the center of the exhibit area. She was perched on the limb of a tree above the heads of the crowd, looking down with astonishment on the modern and sanitary goings-on below her (Elsie is definitely old-fashioned, but she is tolerant of progress and modernization although she does not quite understand them). There were murals of Elsie in the Exhibit Restaurant; her head in bas-relief appeared on badges worn by all employees, as well as on the cookies served with the malted milks. She was all over the lot.

But she was still inanimate; lively, but not living; a personality, but not a person; a symbol, an idea, a figment of the advertising imagination, but not a real cow.

Then suddenly the spark of life was kindled. Elsie became animate with a bang, and with definite overtones of Frankenstein.

To explain how it happened, I must go back a little. For the Borden information staff at the Fair five hundred young women were interviewed. Eighteen went through an intensive schooling; seven passed the final exams. These seven really knew about cows and milk and Borden products, and were ready and eager to answer all questions that an inquisitive public might ask.

But when Elsie went off to Hollywood, Elmer took over and turned the boudoir into the sort of a shambles men are supposed to create when the wife's away.

A month after the Fair opened analysis of questions asked showed that twenty per cent were about milk, or Borden. Twenty per cent wanted directions to the Aquacade or General Motors or the Ladies' Room. Sixty per cent were simply—"Where's Elsie?"

Well, why not? After all, there were 150 live cows in the barns. True, Elsie was supposed to be a symbol, but the public wanted a cow, not a picture of a cow or a statue of a cow. This public clamor was no demand for a single appearance, but for a continuing performance. Histrionic ability, not milking qualities, total production or butterfat content, was wanted—that and bovine glamour.

Such a paragon was found among the Jerseys. There is something about a Jersey. She is diminutive, averaging under a thousand pounds. As a calf she has a fawn-like look she never quite loses. Her color is nice—a creamy buff—and her eyes are soft, limpid and kind. Finally, and most important, she is a born pet, loves people and has curiosity.

The most suitable Jersey was You'll Do Lobelia, age seven. So, dressed in a nice green velvet blanket with Elsie embroidered on it in gold, she took over the rotolactor twice a day, and had the spotlight all to herself. She was a Jersey among Jerseys, a cow among cows. During milking she leaned out and counted the house; tossed her head; singled out people to stare at; smiled—or seemed to.

The public loved Elsie. The first year of the Fair seven and three-fourths millions of people came to see her. At the close of the season she gave a party in the Roosevelt Hotel ballroom to the boys and girls of the press and radio, who had been very nice to her. She loved it, and so did they.

Then Elsie went back home to Brookfield, Massachusetts, to winter. No sooner was she settled than a call came. Finnish Relief was having a big benefit. Could they have Elsie? At that time nothing was too good for the Finns, so she went, collected lots of money and had her portrait done by Hendrik Willem Van Loon. By the time winter had melted away, she had made so many appearances at New York hotels that the better ones were practically second homes to her.

Meanwhile, a second edition of the Fair was impending and it was natural that Elsie should be the star of the whole show. A special boudoir was built for her. Tethered in a four-poster bed she received in a room furnished with churns and milk bottles for lamps, a wheelbarrow for a chaise longue, a wagon-wheel chandelier and oil paintings of her Great-aunt Bess as a bride, and her Uncle Bosworth, who was an admiral in the Spanish-American War. The décor was Early Barn Colonial.

Bed and bedroom were a huge hit and unquestionably furnished the spark that later made Elsie a national four-alarm. More people than ever came to the exhibit; hardly anyone asked anything except—"Where's Elsie?"

Reverberations were heard in Hollywood. Gene Towne had a part for a cow in Louisa Alcott's "Little Men." He asked by wire whether Elsie could come out and play the part. The answer was that the idea was interesting, but so was Elsie's condition; also, how about the New York Fair? Towne wired back that a layette and full maternity facilities would be provided in the Hollywood manner, and as for the New York Fair—phooey!

Elsie started West in July with a personal staff consisting of a veterinary, a personal attendant, and an advance manager. On tour Elsie is surrounded with every comfort and care. Wherever possible she travels in what is known as a horse palace car. It is a commodious affair, designed for Alsabs and Whirlaways, but equally suitable for a bovine lactress. A comfortable box stall in one end is filled with soft bedding. The baggage, scenery and special feed go in the other end, along with the cots for the attendants, one of whom must be with the cow at all times—day and night.

The trip was a minor triumph, with crowds at all way-points, but when the train pulled into Los Angeles' Union Station it became a sensation. There were thou-

sands there—Elsie-admirers, animal-lovers, people who hang around Union Stations, and representatives of the movie world. These included two of Elsie's co-stars in "Little Men"—Kay Francis and Jack Oakie. Everyone was charming, including Elsie. Miss Francis remarked that a cinema career called for many strange things, but the wackiest was going down to a station to meet a cow. Jack Oakie said he was gratified to meet a lady star with no temperament whatever. Elsie ate the orchids that were presented to her, and submitted to caresses. The party left the station with a band, for a couple of parties, then took over her comfortable quarters on the R.K.O. lot.

It was important that our heroine have plenty of rest, quiet and the opportunity to think beautiful thoughts. The blessed event took place a few weeks after her arrival under the care of her veterinary-obstetrician. It was a heifer, as she had hoped, and she was named Beulah Norbelia.

Lobelia, or, rather, Elsie, now had five children and two grandchildren. But far from challenging any of the Grand Old Ladies of the screen, she went through her part like a baby starlet. Between takes she found time to make several personal appearances and even to go to San Francisco with George Bancroft, where they looked over the Golden Gate Exposition.

Elsie's cousin, Staff-Sergeant Bartholomew, is every inch a soldier and no cow-pasture commando.

Meanwhile, back at the New York Fair, it was as if Portia had dropped out of "The Merchant of Venice." An understudy—Pioneer Design Ella—was very beautiful. But people asked—"Where's Elsie?" Borden's erudite young ladies had to admit "that is a different cow—you see, Elsie is a symbol of all Borden cows." The people said, "Oh," disappointedly, and went on to the Aquacade. There were frantic days of brain racking; then inspiration.

"We'll put a bull in the bedroom," the decision was, "and say that he's Elmer, Elsie's husband, who is keeping house for her while she's away." His name was Sybil's Dreaming Royalist. A bull has only one vital function, for the rest he is an irritable, irritating and generally difficult sort of individual to have around the place. Sybil was an exception. He was a taurine Fauntleroy; in fact, undoubtedly the only bull that we could have got to stand all day in a bedroom without banging the place to bits.

Elmer moved into Elsie's boudoir, but it was all mussed up. A large cuspidor was surrounded with cigar and cigarette butts, the chaise longue was rumpled and copies of "Esquire" and "Police Gazette" lay on it. A limp bath towel hung on the beautiful chintz bed canopy; a suit of red underwear on Uncle Bosworth's picture; neckties on all the lamps. The room looked like the quarters of a particularly dissolute bachelor. And where people had laughed at Elsie, they guffawed at Elmer.

In September, Elsie came back with twelve keys presented to her by mayors of cities she had visited en route (by now the collection has grown to forty-four, including the keys to four states). She had Beulah with her, and was gratified to find a calfie-coop and a clothes line, complete with diapers, installed in her boudoir.

Five thousand people and a dozen animals turned out for Elsie's welcome home, and for Beulah's christening party. Among the animals were bears and monkeys, an elephant, and the horse from the Ford exhibit—which really should not be counted since it was concocted from two humans. Beulah was duly anointed with a sprinkle of milk and Elsie was presented with a scroll.

The new boudoir set, together with the fact that Beulah was a cute calf, so charmed the public that during the last two weeks of the Fair all other Borden shows had to be cancelled. The entire exhibit personnel kept traffic in line to the boudoir.

The Fair ended in October and Elsie was taken to her new home at the Walker-Gordon Farm at Plainsboro, New Jersey. On the way (Continued on page 52)

Living Things of Old

By CARROLL LANE FENTON and MILDRED ADAMS FENTON

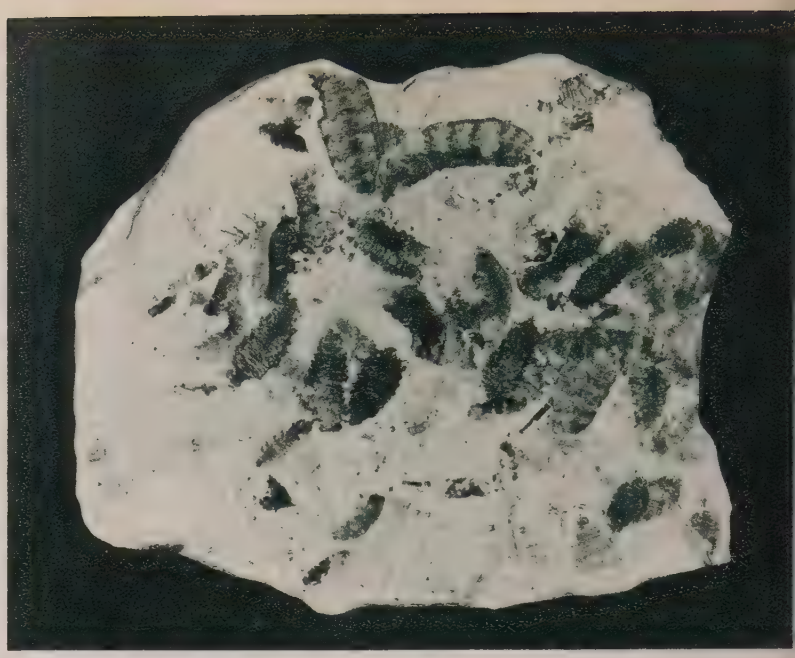
Fossils are remains, impressions or traces of things that lived very long ago. These records were buried in beds of rock. When they are uncovered, they tell us the story of life during ancient ages.

Here we see a few typical fossils. At the upper left are remains of a sea lily, or crinoid, which lived in a sea that covered Indiana some 250,000,000 years ago. Although it looks like a plant, it really is an animal related to the familiar starfish. It is complete from its feathery-looking arms to the "roots" that anchored it to the sea bottom.

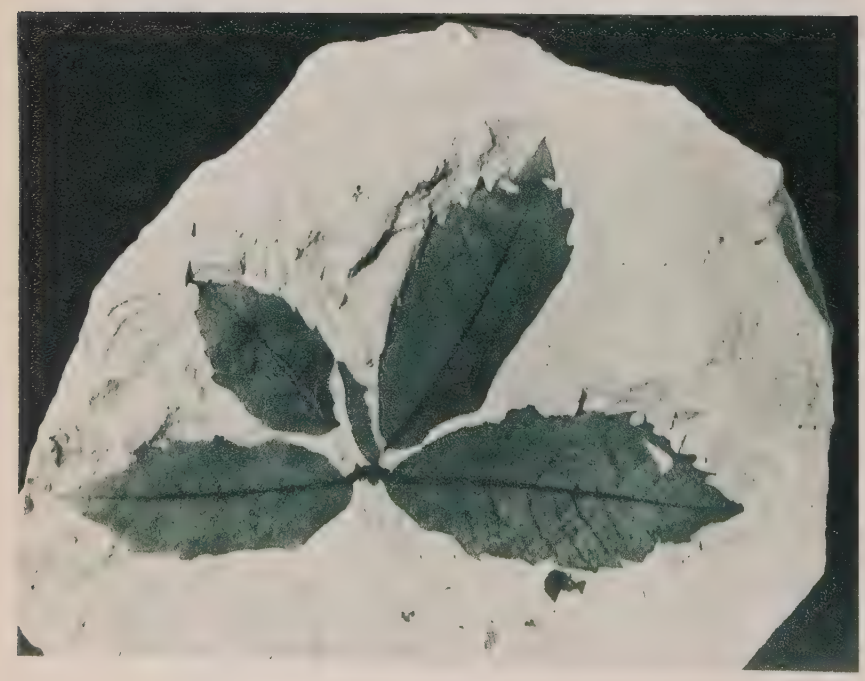
Next comes an impression of a leaf that grew upon a fern of Coal Age Illinois. When the leaf fell it "made its mark" on gray mud that slowly hardened into stone.

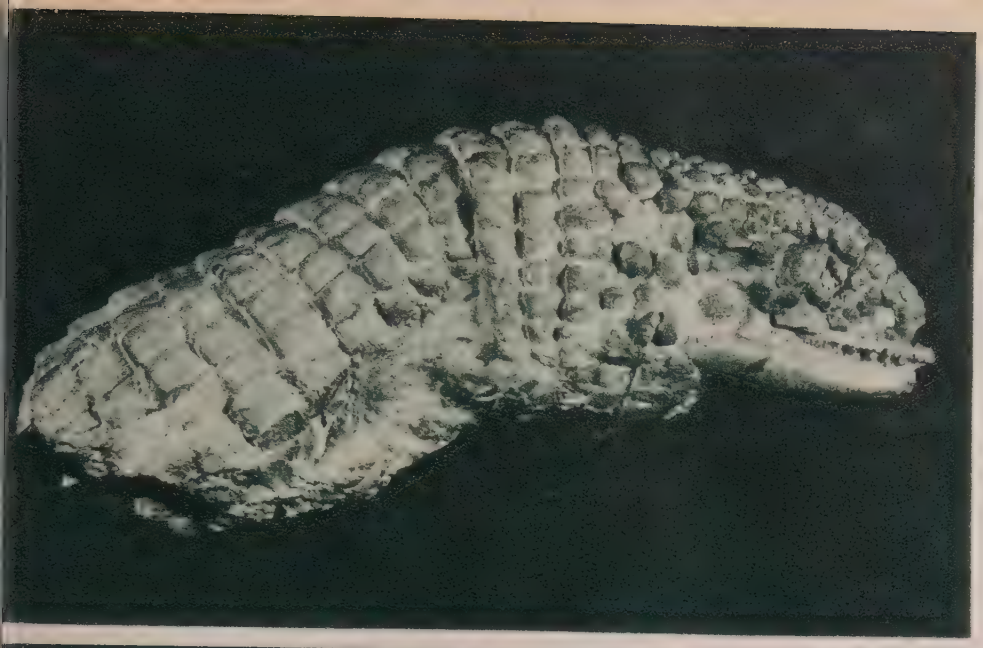
Fossils in the slab at the upper right are traces found near Cincinnati. They began when animals crawled over sticky mud under a shallow sea. More mud covered the different trails and filled them, much as molten iron fills a mold. This slab shows some of those fillings, as well as marks made when broken shells drifted across the mud.

Some of those trails were made by trilobites—odd, armored animals that were distantly related to our lobsters and to horseshoe crabs. The lower picture shows a group of trilobites huddled together on black limestone. Perhaps they were caught and buried there while they were feeding; perhaps the trilobites drifted together after they died. At any rate, such groups are among the fossil hunter's rarest finds. This one was discovered near Trenton Falls, New York.

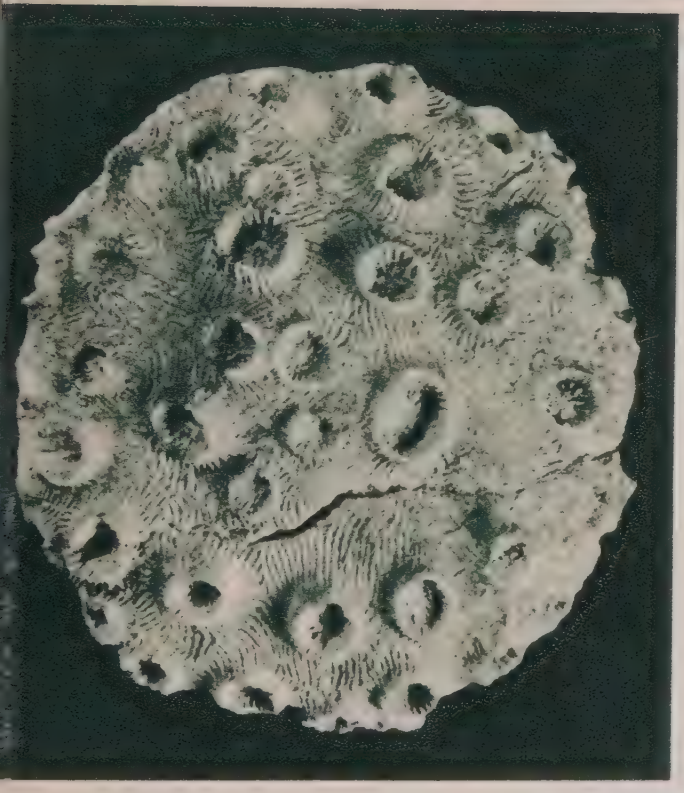


Fossils represent both animals and plants of the sea, fresh water and land. Here we have one tooth of a shark that swam in the ancient Atlantic, which covered the coastal plain on which cities such as Charleston now stand. The young insects lived in a lake, but the odd sea scorpion made its home in a bay where fresh and salt water mingled. The oak tree grew upon land which probably looked much like the valleys of California today.





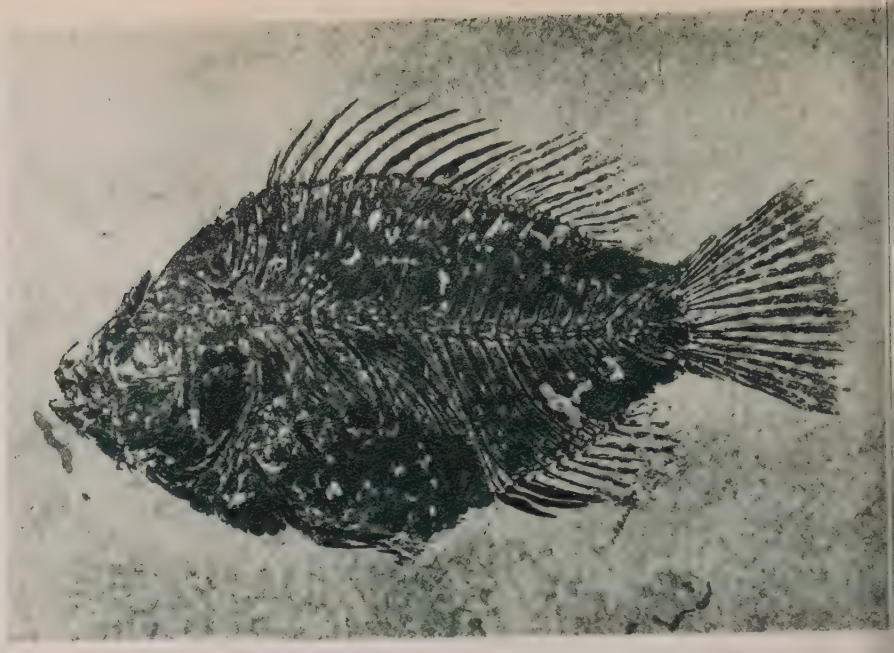
In addition to showing what ancient plants and animals looked like, fossils tell what they did. This reptile, which lived in eastern Wyoming about 40,000,000 years ago, was built like the modern Gila monster, but had thick plates of bone in its skin. It doubtless crawled about eating eggs and clumsy insects that could not get out of the way of the voracious beast.



The corals above, on the other hand, fastened themselves together in a mass that rested on the bottom of a sea that once covered much of Iowa. The sea was so clear that the animals were not much bothered by mud.

This species of crinoid, above right, drifted in the sea, or held to seaweeds with its long arms. Notice that the round bodies have neither roots nor stalks that might have held them to the bottom.

Redwoods need moderate temperatures, a good deal of rain, and frequent fogs. Such requirements tell us what Idaho was like when a redwood dropped these leaves where the town of Baker now stands.



Coal Age thousand-legs, or myriapods, crawled on the ground and hid under dead leaves, as their relatives do today. The one at the left, above, lived in a swampy forest of Illinois a quarter-billion years ago. The fish, which is not nearly so old, was an inhabitant of ancient Wyoming. Its home was a shallow lake, where it fed on insects such as those shown on the second page of this section.

Flat-head borers, at left, are young beetles that tunnel through the wood of trees. Ancient borers made these burrows in a tree of the Petrified Forest, in Arizona. Such burrows are among the rarest and most interesting of fossils. Like most of the other specimens shown in these pictures, they are now in the U. S. National Museum, at Washington.

Modern jellyfish drift about in the sea, or swim by flapping their saucer-shaped bodies. This ancient jellyfish, found near Canandaigua Lake, New York, had the same habits. We do not know whether or not it could sting, like the "sea nettles" that drift near bathing beaches along the modern Atlantic Coast.

Brown Thrashers

By A. C. PARSONS

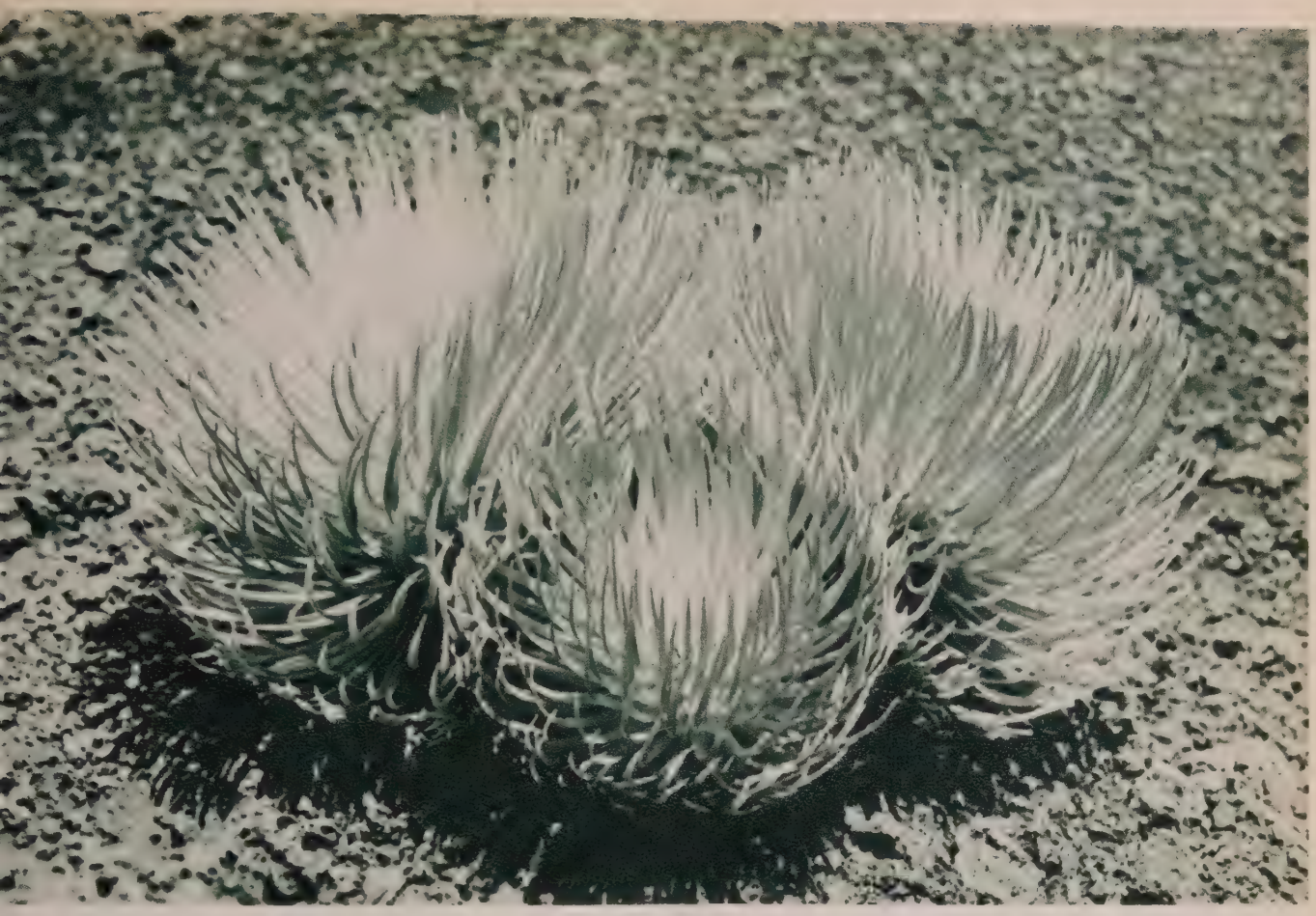
A young brown thrasher, above, was the only survivor of two broods raised during the summer. House cats killed the rest. At the right the parent feeds the young, one eye cocked belligerently at the camera. On the following page, above, the thrasher guards the nest, while, below, the mother bird is photographed on her nest. She was quite fearless and refused to leave and thus permit the eggs to be photographed.

"Thrasher", the dictionary tells us, is a corruption of "thrush"; the naturalist says the thrasher is so named because he thrashes about so wildly when disturbed or attacked. From personal experience we believe the latter.

When a pair of brown thrashers built a nest in a tangle of shrubbery in a corner of the garden, we decided to photograph the development of the young from eggs to the day the birds would leave the nest. We never did get good pictures of the eggs because the birds were always in the way, one on the nest, the other attacking us from every angle. They have strong, sharp beaks and show little fear of humans. If you have a bald spot be sure to wear a helmet.

By the time the young were hatched the adult birds were more accustomed to us, but still they refused to let us set the camera closer than three feet from the nest. Whenever we approached, one bird was always there. Flash bulbs seemed to have no disturbing effect on young or old birds. Neither did they seem to fear the flash reflector.

The first brood of four birds was destroyed by a prowling house cat before we could finish the series. The birds built another nest somewhat higher up and raised four more young, but the cat got three of these. The fourth escaped by fluttering into a basket and probably survived.



A splendid and striking plant of the silversword and, below, a plant with a park ranger's hat beside it to give an idea of its size. On the following page we see the flower spike of the silversword and a picture of the crater of Haleakala, which provides the seemingly most inhospitable habitat of this plant of Hawaii.

Silversword—Rare Jewel of an Hawaiian Crater

By SANDFORD C. SMITH

Photographs from Davart

Silversword is considered by many as one of the rarest and most beautiful of Nature's plant creations. The species here pictured, *Argyroxiphium macrocephalum*, is known only from Haleakala, on Maui Island.

It was sown by invisible hands in this desolate pit seven and one-half miles long, and three wide, surrounded by walls one thousand feet high, and ten thousand feet above sea-level. It now shares this arid waste with a few other plants that are able to survive its stern rigors. This cold pit is one of the largest of its kind in the world, but seems dwarfed by the vastness of the silent and imposing chalice. It is sparse of verdure, lacking animal life, and piled with cinders and debris. From a legend concerning the demigod Maui comes the Hawaiian name Haleakala, meaning "House of the Sun."

On the slopes of disintegrating hummocks, watered only by vagrant show-

ers, silversword, taking its sustenance from ashes and its beauty from desolation, buries its seed, grows to maturity and eventually bursts into a geyser of purple bloom set in a silver bowl.

Upon taking root, the plant sends up a half-dozen long, thin leaves, superficially resembling silver-plated swords. These curve outward from a common center and increase in size and number in from two to five years.

There may be from three to five hundred leaves when the fast-growing flowering stalk sends forth its cone-shaped cluster, made up of purple blooms like tiny asters. The color becomes richer and deeper in the three or four weeks of bloom.

The end of the silversword comes swiftly. Its seeds are speedily matured, and, within a week after the climax of bloom, the plant dies. But it has met hospitality in what seems a barren and forbidding soil, finding warmth for its roots and breathing space for silverswords to come.

The plants have now become rare and scattered, not more than 2500 in the entire nineteen square miles. Up to about 1900, the species was exceedingly abundant, but in a tract of ten acres that was closely crowded in the nineties, not a plant was found in 1927. Unrestricted gathering by tourists had denuded the area. Away from the valley of this extinct volcano silversword plants die of homesickness in infancy. Now the dwindling stock is better guarded, that those who follow us may view them.

There are several other related species, all on the Hawaiian group. One, the greensword, *A. virescens,* shares its habitat with the silversword here shown. Others are on Mauna Loa and Mauna Kea on Hawaii, and at other points. Close students of the group believe that all the various species have developed from some common American ancestor, a member of the great Composite family, that in ancient times found lodgment in some manner on the islands making the Hawaiian Group.

As We See It

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Stories of Vicious Eagles

WE WONDER whether the newspapers will ever stop printing articles about murderous eagles attacking young children, with all the details of the killing of the assailant, pictures of its outstretched form draped on a fence, the likenesses of the innocent intended victim, the brave rescuer and interested neighbors?

Our latest example of this kind of tragedy occurred recently near the mouth of Four-mile Run, Virginia. Its story made the front page of the morning *Washington Post*, and found a less conspicuous place in the afternoon papers. In the morning it was a "ferocious eagle", but by afternoon it had been toned down to a "big hawk". In both cases the published photograph showed plainly that the unfortunate bird was a fish-hawk, or osprey. Its large size rather than its ferocity led to its death.

In lower Virginia and in Maryland, where the osprey nests in numbers, its presence is welcomed, and the bird often responds by building its aerie close to the planter's home, and accepting his hospitality year after year. In that region no citizen, or his children, has any feeling for the familiar bird but friendliness. All know that the osprey eats nothing but fish, which it seizes near the surface of river or inlet, and they enjoy the bird's graceful flight as it soars and hovers at its fishing. The planter and his unlearned helpers, alike, respect the right of the bird to live. They like to see it around, and do not begrudge it an occasional fish. They distinguish the osprey from the eagle, our national emblem, and respect them equally.

Alexander Wilson, more than a century ago, wrote a poem setting forth the friendliness existing between the rural fisherman and the fish-hawk. But times have changed. The fisherman's boy, perhaps, has become a city resident, and, whether reporter or mere idler with a gun, may see nothing in either eagle or osprey but a predacious bird that makes a tempting mark, or a bird that he regards as a vicious enemy of mankind.

Of course, eagles as attacker of helpless babes are nothing new—in print. Since early times, folklore and love of publicity have combined to produce stories of babes captured by eagles, and artists have depicted them in the act. In the stories of early times, the babe might be carried away just as the frantic mother rushed out of her mountain chalet, or it might be shown lying in the aerie, about to become food for the young eagles. In more modern times these child "victims" have grown larger and heavier. We now read newspaper accounts of half-grown boys and girls who have escaped death only by a hair's breadth.

In the meantime the food habits and the powers of the eagles have been studied. The carrying ability of birds of exceptional strength has been tested. In all the voluminous literature one will find not one authentic account of an eagle carrying away a child, although boys weighing up to thirty-five pounds may figure in the tales. But in an actual test a tame golden eagle, given a flying start fifteen feet from the ground, carried an eight-pound weight only fourteen yards before he was forced to the ground.

As for the osprey, recently publicized as an eagle in the District of Columbia, it may have been sick or injured. It had earlier landed on the porch of a house, whose occupant kicked at the bird and complained that the fish-hawk "showed fight".

It would seem that reporters, and particularly editors, by this time, should know better than to print such silly fiction. Such stories cannot help but perpetuate old wives' tales and prejudices against hawks, owls and eagles, most of which are now proved beyond question to be beneficial birds.

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Nature in Print

By HOWARD ZAHNISER

Edwin Way Teale in action.

EARLY last spring Edwin Way Teale offered readers in search of a hobby a volume entitled *Byways to Adventure: A Guide to Nature Hobbies.* In a series of seventeen chapters on such subjects as "Bird Watching," "Reptile Lore," and "Fossil Hunting," Mr. Teale described the attractions of the various outdoor pursuits he recommended, cited notable examples of their contributions to the happiness of those who had followed them, and furnished prospective tyros a list of books and magazines dealing with each suggested pursuit of happiness.

Describing an interest in the natural world as "a valuable asset for either calm or troubled hours," Mr. Teale in this inspiring and definitely practical guide book testified that "hobby trails, in the field of natural history, are byways to quiet but real adventures."

"From boys, with energy to spare, to retired professional men, with time on their hands, numerous people," he said, "have found opportunities in nature avocations for fun and relaxation—and sometimes achievement as well."

This is an interesting statement, for Mr. Teale's most recent volume, engagingly entitled *Near Horizons,* makes it apparent that he himself is among those who by following the trail of an avocation have found achievement. And it is an achievement of significant interest, for it is not merely—with the admiration of others—a personal success in developing an avocation into an activity of vocational or professional importance. A writer with many readers and something worth writing, Mr. Teale has reached the honorable estate of one with both the means for enriching others and the welcome of his beneficiaries. Having thus the most valid kind of success that a writer can attain, he has with it the appreciation of readers who sense increasing values in his contributions to their literature. His byways to adventure have become highways to understanding.

Near Horizons: The Story of an Insect Garden, which has suggested these observations, is not, however, their sole justification. The fact is rather that its perusal brings an awareness of what might have been expected upon the publication of two earlier works—*Grassroot Jungles: A Book of Insects* in 1937, and *The Golden Throng: A Book About Bees* in 1940. This awareness is of the fact that Mr. Teale is capable not only of writing an individual work of interest and value but also of interpreting a whole sphere of life.

It is perhaps a paradox that *Near Horizons* should be an example of its author's widening horizons, yet it seems apparent. "At our feet," wrote Mr. Teale in the opening sentence of *Grassroot Jungles,* "often unnoticed in the rush of daily events, is the wonder world of the insects." The last words of *Near Horizons* are: "Nature, in all her acts, reflects her faith in the future. In the ground and the trees and the swamp of my Insect Garden, she has written her endorsement of Emerson's words: 'The sun will shine after every storm; there is a solution of every problem; and the soul's highest duty is to be of good cheer.' " Between the two volumes with these expressions came *The Golden Throng,* in which Mr. Teale sought to show—and did show—that "there is beauty as well as mystery in the life of the bee."

There is even more to note in Mr. Teale's writings than this progression in central interest from "wonder," to "beauty as well as mystery," and on to "faith." For *Grassroot Jungles* was comparatively diverse and episodic, *The Golden Throng* was comprehensive and more intense, and *Near Horizons,* though varied in incident and observation, is integrated through the most difficult of all means—the reflective human experiences of one man. No longer concerned with insects alone, Mr. Teale in his newly-published chronicle of an insect garden writes also of birds and of moles, thus confirming in another way one's suspicion that his writings are only beginning.

One should be prompt, of course, to point out how misleading it would be to consider *Grassroot Jungles* and *The Golden Throng* as early works of fading importance because a later work reveals growth. The fact is that both these books afford reading that no one interested in insect life can afford to miss, and both have indeed been widely appreciated. *The Golden Throng* is now being translated into Swedish. Last July it was published in London, its sponsors there having persevered through two (Continued on page 50)

Let the Big Bad Wolf huff and puff, still—

People *Can* Live in Grass Houses

By MARGARET WHITTEMORE

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Wichita Indians from Anadarko, Oklahoma, building a grass lodge on Meade Island in the Little Arkansas River as a memorial to their tribe, for which Wichita was named.

ALTHOUGH the childhood story and Walt Disney's classic film, "The Three Little Pigs," seem to have established the fact that living in grass houses is dangerous, particularly if there is a big bad wolf around, grass has its merits as building material. Today, faced with priorities and lumber shortages for private building, many a farmer is providing houses of straw and hay, not only for pigs, but for cows and chickens as well. In this way they are keeping the wolf from the door, both literally and figuratively.

Throughout the Middle West, straw is proving a satisfactory substitute for lumber in the construction of poultry houses, granaries, lambing shelters and machine sheds. Even where housing facilities are sufficient for normal needs, emergency straw hen houses take care of the increase in egg and poultry production now asked by the Government.

Baled wheat straw solved the poultry-house problem for an Axtell, Kansas, farmer last winter. It took three hundred bales, at ten cents each, to thatch the roof. A Missouri farmer built a laying-house thirty feet square by tramping straw between sheets of woven wire for the walls, and laying a loose-straw roof on pole supports. Caves or cattle shelters are formed of threshing straw spread over pole frames covered with brush and woven wire. Silos are built of baled hay or corn fodder piled crosswise and lined with large sheets of oiled paper. Chicken lofts packed with straw under the roof add warmth in winter and provide insulation against the sun in summer.

A shed of baled wheat straw, too coarse for fodder, sheltered thirty head of dairy cattle near Topeka, Kansas, for two years. One hundred bales of prairie grass hay that had long lain damp in a meadow lot were salvaged by an enterprising carpenter and built into a neat little shed. With baled hay walls eighteen inches thick, a composition roof and isinglass windows, it houses chickens in one end and a cow in the other.

During Civil War times fugitive slaves were forced to resort to all sorts of expedients in escaping from their masters. Irving Bacheller, in his book, *A Man for the Ages*, describes a hollow haystack half way between the house and the barn, with a room in the middle of it. This hideout was six feet high with a space nearly eight feet square where concealment was sure. Near the bottom of the stack was an entrance well screened by pendant hay.

Similar in shape were the grass-thatched lodges that Coronado and his Spanish Conquistadores found when they crossed the great plains more than four hundred years ago. The Quivira Indians who built them were nicknamed "grass-house dwellers." Many of their

A "soddy," typical sod house of western Kansas. Such homes sheltered the early settlers from the prairie winds.

Baled hay serves as walls for this sizable shed built by a Kansas farmer not far from Topeka. Below is some of the construction detail involved in building a utility house for the farm from poles, wire, and grass or hay. In these days of priorities and frequent lumber shortages for private building, ingenuity and the lessons of the pioneers can be turned to good use. War demands greater production and more farm buildings are needed. Let grass do it.

descendants now living at Anadarko, Oklahoma, still live in grass lodges, built to last a lifetime. With them house building is a sacred undertaking. When the first cedar post is set, the mother bows her head and prays to the Great Spirit. Here the women are not only the architects, but they also contribute much of the manual labor.

Forming a circle about twenty feet in diameter are posts, each having a crotch at the top where beams are laid. Long cedar poles are placed against these, leaning inward. Through this framework willow rods are woven, their tops coming together in a peak. This lacework forms a basis for long grasses, which are laid on in thick masses and bound down in tiers, overlapping like shingles in order to shed water. Where the rods join, ornamental tufts of grass are tied. Four projecting beams at the apex of the roof point toward the four directions of the compass, while a central rod extends straight upward. The purpose of this is to invite the Deity and the four winds to enter the lodge and to bestow their blessings upon the inhabitants.

On an island in the Little Arkansas River at Wichita, Kansas, stands one of these dome-shaped wigwams, built in the spring of 1927 at the request of certain citizens of Wichita. Suk-ah, one of the older women of the tribe, had an important part in the work. Unlike most of the plains Indians, the grass-house dwellers were pottery makers, as well as farmers and hunters. About a hundred years after the visit of Coronado they were forced by the invasion of the Osages on the great plains to migrate southward. The site of their principal city was for centuries the same as that now occupied by the metropolis of Wichita.

Temporary dwellings of poles covered with grass were made by other plains tribes and were common among certain Oregon Indians, who used them for storage purposes. The Pawnee nation built similar lodges, covering the grass thatch with a thick strip of sod. The Osages had earth-covered structures, as well as long dwellings rounded like covered wagons and overlaid with mattings of grass and reeds.

When, in 1854, members of the New England Emigrant Aid Company came to Kansas to help make it a free State, they, too, were faced with a shortage of lumber. The tents they had brought with them offered scant protection against the approach of cold weather, and a sawmill that was promised had not yet arrived. The "soddy," which later played an important part in the settlement of the treeless plains, was not fully developed. Sods were sometimes used for walls, but not for the entire structure.

Thus there evolved at Lawrence, the spot they had chosen as a town-site, a style of building called the "hay tent," which seems to have been peculiar to that locality and to that period of Kansas history. It consisted of two rows of poles, brought together at the top, the sides thatched with prairie hay. The house

was all roof and gable with windows and doors only at the ends. The gables were built up with sod.

One of the first hay tents was known as the "Pioneer Boarding House," serving also as a public meeting-house. It was fifty feet long and twenty feet wide. Here the first sermon was preached and Plymouth Church organized—trunks forming a pulpit, and beds and boxes providing seats. When, late in the autumn, this hay tent was accidentally destroyed by fire, it was replaced by another more pretentious one. In addition to walls of hay, this new structure, the "St. Nicholas Hotel," was banked up all around with sod to the height of three or four feet, and lined inside with cotton cloth. It was fortunate that the newcomers' first winter in Kansas proved to be a mild one. They thought they had found the "American Italy."

For anyone contemplating the construction of a grass house, Nature offers a wide choice of materials. Botanists estimate the variety of grasses at eight or nine thousand; and the United States is considered, next to Brazil, the grassiest region in the world. Mrs. Agnes Chase, custodian of the extensive collection of grass in the Smithsonian Institution in Washington, D. C., found as many as one hundred different species growing in one acre in the southern states.

Out on the western Kansas plains, where trees are scarce and only the shortest grasses are able to cope with the arid conditions, travelers can still see here and there little square mounds of earth that mark the homes of the pioneers. The tough sod of many-rooted buffalo grass was cut into long strips, rolled into bundles, and hauled to the site where the strips were laid, basket-weave style, to form the walls. This turf was said to form better bricks than the Hebrews turned out for Pharoah. The walls were two or three feet thick and the roof was shingled with other sods, which grew green under spring rains. Some were built against the sides of hillocks, affording protection from gales and cyclones. Others were partly caves or dugouts. Clumps of pig-weed grew about the door. Field-mice sometimes honeycombed the walls with their burrows, while rain and snow tore away the earthen sides. Yet without special upkeep, a sod house would last thirty-five or forty years.

Within a few years sod houses were the homes of many ranchers and sheep owners in the high plains along our northern border, and some of these are probably still in use. Well built on selected sites, these homes gave good protection from the heats of the summer and the winter blizzards.

Thurlow Lieurance, composer of Indian music, spent his childhood in a "soddy" near Pawnee Rock in western Kansas, and many a successful business man received his early education in a sod schoolhouse. As someone said, the sod house "was the right stuff for a sturdy pioneer country, and fit for any great man to be born in." Many point pridefully to such birthplace.

Economical provision can be made for expansion in the numbers of barnyard fowl or other farm animals by building partly with grass. Although temporary, such buildings will last for a good many years with little necessary repair. An even more makeshift affair is the straw shelter below built for his cattle by a Franklin County, Kansas, farmer. Nature offers a wide choice of grasses for building, and, next to Brazil, this country is the grassiest in the world.

A Boy and Some Birds

NELSON AVERY and five of his pals were roaming about the countryside and saw a farmer toss aside a nest in which were six week-old starlings. Each boy picked up a bird, but Nelson feels differently about birds than do many boys. So, with a quarter in his pocket, he offered to buy the other five birds. The sale was made and the starling sextet travelled home to Montreal with their foster parent.

When Nelson's father built his home he also constructed a rock garden planned with birds in mind. An easily drainable bird bath was installed, and a little house that has had "Welcome" on the mat for bird tenants, and this the young starlings took over.

When the pictures above were taken the six orphan starlings, which Nelson raised on a bread and milk diet, were six weeks old. They would come at his call and set up a joint clamor for food. They were perfectly tame with their benefactor but were afraid of other people. Morris Hartman, who took the pictures, was able to make friends with them, possibly, he thinks, because he has tamed and trained canaries.

When Nelson left for the family's summer home at the end of June he entrusted his birds to neighbors. However, they apparently were not interested in birds, and the starlings soon found that they would have to forage for themselves and left. On their legs, however, they bore bands affixed by Dan Ryan, Montreal bird-bander, so Nelson may hear from them again some day.

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Chickadee

By ORLO EVAN WHEELER

Hello! Hello! Chickadee,
Friends for dinner? Three I see
Gouging out those bits of suet
Like they saw no limit to it—
Calling all the while they do it
"CHICK-A-DEE-DEE CHICKADEE."

Each a clever acrobat
Jumping, turning this way, that,
Hanging downwards by his feet—
Pausing now and then to greet
Incoming friends and still repeat
"CHICK-A-DEE-DEE CHICKADEE."

Welcome! Welcome! Chickadee,
Days are cheerier, seems to me
When the feeding shelf without
Lures each jolly gadabout
Near enough to hear him shout
"CHICK-A-DEE-DEE CHICKADEE."

U. S. FOREST SERVICE PHOTOGRAPH

ttle Betty Ann is the same age as this planting of red pine in an abandoned field that had last supported corn but was of little value for any crop except trees.

Plant an Acre of Trees

By ALF Z. NELSON

F you are a city dweller, have you ever wondered what you could do with your weekends and holidays that would take you into the country? If u like the outdoors and a moderate form of exrcise, and like to see things grow, buy an acre—or ro—of farmland within a few miles of the city and ant it to trees. Establish a Victory tree plantation well as a Victory garden.

Perhaps Farmer Brown has a 160-acre tract of land, me of which he uses for crops, and the rest for pasring his animals. A willow-flanked stream cuts rough a corner of his property, and there the land poorer than the rest and does not earn its keep. He ay be willing to sell an acre or two for $25 to $50, id to furnish a deed with the right-of-access included. lthough the land may be poor for agriculture, it must poor indeed if it will not produce a crop of thrifty ees. Of course, the tract should not be too rocky, id, preferably, not too hilly. It should be reasonably ire of underbrush and other growth, and should, if ossible, be near a lake, pond, or stream. Such sites ay most frequently be found off the beaten trail, and ou may have to search diligently.

Having found and purchased such an area, and with l legal formalities out of the way, you can begin aking your planting plans. By writing your State Forester, the United States Forest Service, or by conferring with the local agricultural agent, a wealth of information is yours. You will be surprised how simple the establishment of a plantation of trees is when carried out according to instructions.

In the North most tree planting is done either in the spring or the fall. Your choice of species should be guided by information received from the authorities and by your own preferences. Perhaps you would like to plant a solid stand of red pine or of white pine. Perhaps an admixture of such species as white spruce, white and red pine and hemlock would appeal to you. Hardwood species may also be planted if your taste lies in that direction. Planting an admixture is usually considered best in preventing losses due to wind, insects and disease. Also, the type of land is a factor in choosing species to plant. Nursery stock may frequently be obtained at cost through the State Forest Service. "Pedigreed" forest tree seeds may be secured from a number of sources with which you may establish a miniature nursery to grow your own seedlings.

An acre contains 43,560 square feet. It measures, if square, about 209 feet on a side. If each tree is planted in the center of a square that measures six by six feet, you will need 1210 seedlings, or transplants, to plant up your acre. This is a recommended spacing for the

usual type of forest planting, although to many it may seem very close. One cannot expect all of the seedlings set out to live, however, and the closer spacing induces greater utilization of the area. Transplant stock is preferred to seedlings since they are hardier and are more apt to survive. It is usually three or four years old, which is explained by the fact that after the seed that has been planted in the nursery has germinated and has developed for a year or two as a seedling, it is dug up and planted in another bed where it grows for a year or two before being set out in a forest plantation.

The actual process of planting requires few tools. A spade, mattock or hoe, and two or three galvanized pails are enough. The work, taken easily, is invigorating and fine for that waistline. Perhaps you will plant up an acre in such short time that you can add another acre or two to your "forest estate". It may be necessary to fence the tract against rabbits and domestic animals, or the season may be very dry resulting in the death of some of the transplants and the necessity of doing some replanting. The clearing of weeds and underbrush might require a portion of your time before you begin to plant, and also after planting to prevent their getting the upper hand.

After your plantation has been established you will see an area symmetrically dotted with embryo trees. Watching them grow and caring for them throughout the seasons gives one a distinct thrill. You are a partner with Nature. Their height growth may be close to a foot a year for some species and where the site is good. So in six years you may have trees as tall as you are. Since the trees branch out it will be desirable to make thinnings from time to time, cutting out a number where they cluster too thickly. Also, pruning off the lower branches may later be desirable to improve the appearance of the stand and to increase the quality of the wood. Soon it will be possible almost to lose yourself in your small forest.

Thinnings made in the plantation may supply enough wood to keep your fireplace adequately furnished. At Christmas time you can provide not only yourself but relatives and friends with select Christmas trees cut in thinning the stand. Pine boughs and needles will always be available for home decoration. If wood-working is a hobby you will have, in time, a source of supply for many of your wood requirements. You will have a private picnic ground and a delightful spot to hold moonlight steak fries. And you will not have to search far for the wood to build your fire. On your vacation, if you like camping, you can drive the short distance to your "forest estate" and have unlimited privacy. Your trees may eventually furnish logs with which to build a cabin.

To some people nothing in the wide field of Nature study is quite so interesting as trees. And perhaps nothing provides such an opportunity for amateur scientific investigation as does the study of trees. For such people their "forest estates" provide admirable experimental laboratories. By means of an instrument called an "increment borer" the age and rate of growth of any tree may be easily determined. The height growth of trees each year is frequently indicated by the distance between the whorls of branches. The form that trees take growing in close association with each other as contrasted with trees growing in the open is a phenomenon of much interest. When the trees begin producing cones you will have an abundant source of seed from which seedlings may be grown. At Yuletide the cones may be used for decorative purposes and when dipped in a solution of various salts and burned in the fireplace, they produce flames of many colors. Yule logs may also be made from the products of your forest. They serve as unique and welcome Christmas gifts.

Your "forest estate" is a safe playground for your children. They will be in the country where healthful air and sunshine abound. Here would be a spot where you could educate your children in the ways of Nature. To watch trees you have planted grow from seedlings to saplings, and finally into large trees, is an inspiring pursuit. Each year photograph your young son alongside the trees of your forest and watch them grow up together. One day they will be his trees.

Beyond the personal satisfaction to be derived from planting an acre or two of trees, there is a broader significance. In doing this one has practiced reforestation; has put idle lands to work producing that for which they are best fitted. One's acre or two, then, is a symbol of the restoration of forest to land that, most probably, once supported trees that contributed to the early upbuilding of our country. For generations we harvested our forest resources as though they were inexhaustible. Today we conserve them; try to protect them from fire; practice forestry; replace the cut timber. With your little acre you are helping in this

Today the Elm

By ISABEL WILLIAMS

Today the elm seems less a tree
Than a study in anatomy
Black-ribbed and angularly drawn
Upon the palimpsest of dawn;
But he who measures it remembers
From pages other than December's
A branch that snow-caparisoned
Became a pussy-willow wand,
Buds with soft fists clenched tight in birth
As spring's green tempest shook the earth,
Leaves like an aureole on its head,
Brown leaves like days beneath it spread.

The planet's running footsteps veer
Back to the sun's ascendant year
Whose cyclorama will unfold
More silver bloom and green and gold;
Now through the elm, thin arms raised high,
The heart perceives the open sky.

A young least auklet of the Aleutians, photographed by the author on Kavalaga Island.

A relation on the same island also posed for a snapshot. It is a young crested auklet.

In the Aleutians, we know, Yank bats Jap, but also, it appears—

Fish Bites Bird

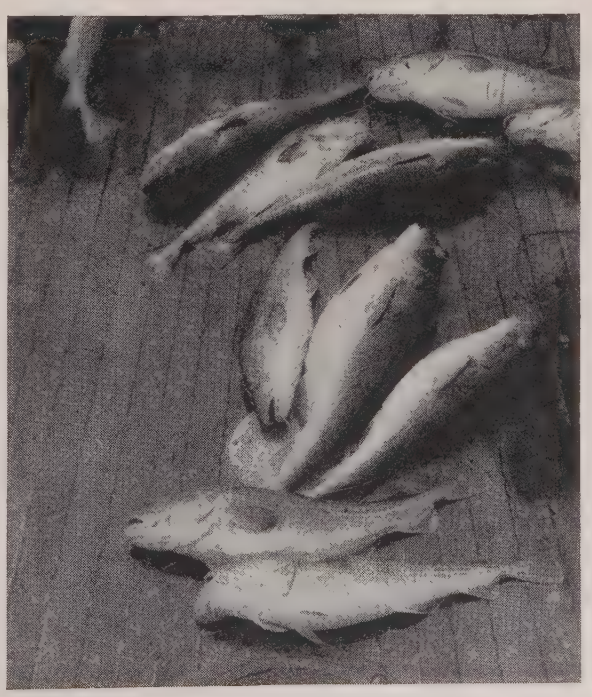
By VICTOR B. SCHEFFER

Off the Island of Chuginadak, in the Aleutian Islands of Alaska, we were fishing for cod over the rail of a boat by the method known as "jigging". In case you're not familiar with the term, we had fastened a pair of hooks to a shiny strip of brass on the end of a line and were jerking the rig upward at intervals of a few seconds. As the fish flopped to the deck and were dressed we delved into their stomach contents as a matter of scientific procedure to learn what we could about their choice of foods.

Now the Alaska cod, *Gadus macrocephalus* is known as a bottom feeder. The marine life found in the debris of the last meal usually includes the remains of clams, snails, crabs, amphipods, shrimps, sea urchins, and starfish. Imagine our amazement, then, when out of the stomach of a two-foot cod there popped the head and bill of an adult cormorant, or shag!

The question at once arose, would a cod often forage into water near the surface where it might be in position to seize diving birds? We asked a commercial fisherman from Bristol Bay with long experience in fishing for "Norwegian turkey". He volunteered the information that when cod were biting as fast as the hook is rebaited, it is a common practice to shorten the line slightly each time that it is hauled in, until finally the fish are biting near the surface. Possibility Number One.

Furthermore, it is a well-known fact that cormorants can dive nearly to the sea bottom in pursuit of food and thus might readily enter the deep-water haunt of the cod. C. I. Clay, of Eureka, California, has recorded Baird's cormorant being caught in fish nets at a depth of 20 fathoms (120 feet), so this is Possibility Number Two.



Alaska cod caught by the method known as jigging near Atka Island in the Aleutians.

Regardless of whether the cod encountered the bird while swimming in deep or in shallow water, however, we believe that the fish would find it as easy to seize the bird as it would a rapidly moving artificial lure.

It struck us that the capture of a cormorant by a cod was one of Nature's practical ways of making retribution for the scores of young cod that the bird must have eaten in the course of its marauding career. The reputation of the cormorant for diligence in fishing is well known. The Chinese, taking advantage of the bird's enthusiasm and skill, have trained it to dive at the end of a long leash in pur-

One of the Aleutian Islands—Segula—a volcanic cone that supports a large colony of nesting birds.

suit of fish, which are promptly brought into a basket held by the owner. In a study of a group of pelagic cormorants, the Biological Survey found that fishes composed about three-quarters of the total volume of the stomach contents, the other quarter being made up of the bodies of small crustaceans.

The capture of sea-diving birds by fishes may occur more often than is generally supposed. From a cod taken off Ogliuga Island we recovered the entire body of a paroquet auklet, or sea quail. In this case the bones, feathers, bill, and feet were all in place, though considerably softened. Auklets, like cormorants, feed beneath the surface of the sea, but instead of fish, they capture, one by one, the tiny organisms that make up the marine plankton, a term for the aggregate of floating microscopic life in the sea that fishermen know as "red feed", or "whale feed". Our first information on the feeding habits of auklets was obtained on the rocky slopes of Semisopochnoi Island, where we noticed that as the birds returned to their nests from the sea, an occasional one, excited by our presence, would disgorge the contents of its crop on the rocks. In every case the oily, salmon-colored mass was composed of the bodies of crustaceans from one-eighth to one-half an inch in length, a remarkably rich and nutritious "chowder".

Dr. G. Dallas Hanna, who spent several years in the Pribilof Islands, writes: "On several occasions I have been on fishing parties out among the crested auklets and twice we pulled up codfish which had in their stomachs in one case one, and in the other case two, birds of this species. As the cod is a bottom feeder it seems evident that the birds descend to 30 fathoms, the depth of the water at the localities concerned. I believe that it is customary for most of the diving birds to feed on the bottom, because I have been unable to secure amphipods at intermediate depths in the winter time. In summer, the crustaceans come nearer the surface and are more easily secured."

Another sea-going biologist, John Cobb, writes of finding in a cod taken in the Shumagin Islands "three medium-sized, duck-like birds with bright red feet [probably the pigeon guillemot, *Cepphus columba*], known locally as 'Alaska Pigeons'. They had evidently been swallowed but a short time before, as they were all in an excellent state of preservation."

Because of the enormous numbers of both cod and diving birds among the Aleutian Islands, conflicts between the two are probably of frequent occurrence. To those who insist that every form of wildlife must be "good for something" or else submit to extermination by man we suggest the nice problem: Should a bounty be placed on the cormorant for destroying the cod, or on the cod for capturing the cormorant?

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Forest Magic

By LENORE EVERSOLE FISHER

Beneath the stars' close-tufted candlewick,
I saw a tawny, antlered creature pick
His wary way in balsamed tapestry,
To seek the moon-dark pool of Manistee.

Then sudden scent of danger, sudden fright,
A sudden lunge into the forest night—
His body might have been a fallen pine,
His antlers, branches of a tangled vine.

A Shot of a Lifetime

By FRANK CLODFELTER

THE bear was upside down—at least that is the way it looked through the ground glass of the camera.

I was down on my knees in front of a hibernating black bear of dangerous looking proportions in a snow-covered "laurel hell" on the slopes of eastern America's highest peak—Mt. Mitchell in western North Carolina. My head was under the black focusing cloth peering through the view camera, watching the bear for signs of movement and getting the range to fire at close quarters with sensitized film.

It was a major bear-and-photography problem. Caution made it necessary to be able to get up quickly and run, or climb a tree, in case Bruin was argumentative. The wide angle lens made it necessary to get closer than desirable to get a close-up. The black bear against the dark interior of his home under the roots of the old wind-blown chestnut would not show up in a photograph without the use of a flash bulb, and I did not have synchronized flash. So it was necessary to cut the aperture of the lens down so that a quick bulb shot would not over-expose the outside or sunlit foliage, and fire a hand-held flash bulb at the moment the shutter was opened and closed, to make the bear stand out in the picture.

Everything was going quietly until my companion, Sol Reese, decided he wanted to be in on the rare picture and appear to be actually peering in at the bear. In maneuvering into position he broke some brush with his boots and the bear moved slightly. As the first flash bulb went off Bruin raised his head and glared at me, then dropped back into a sleeping position.

As the other bulbs went off on the once-in-a-lifetime picture Bruin raised his head and yawned. I missed that shot. Given this encouragement I moved the legs of the tripod a little closer on account of some "saw" briars. This proved to be the last straw. The bear moved, giving a sudden whoof after the third exposure had been made. That was warning enough, and, locking my arm around the tripod and camera, I tore away. I heard a heavy noise back of me. It was only Sol's boots helping me clear the laurel off Mt. Mitchell.

To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south. Time given is Standard Time; add one hour for War Time.

The Heavens in 1943

By ISABEL M. LEWIS

DURING the coming year solar activity will decrease as the time of sunspot minimum approaches. There will be fewer sunspots, fewer magnetic storms, less interference with telegraphic and radio communications than during the past few years. All types of solar disturbances and the terrestrial phenomena are greatest when sunspots are most numerous. Great sunspot groups may occur even during a sunspot minimum period but on the whole the trend during the coming year will be toward fewer sunspots. There also will be less frequent and less intense auroral displays, less ultra violet radiation from the sun entering the earth's atmosphere, while the surface air temperature of the earth will be, on the average, somewhat higher.

In 1943 there will be four eclipses—two of the sun and two of the moon. The first will be a total eclipse of the sun on February 4-5, the double date arising from the fact that the path of the eclipse crosses the date line and, in Greenwich Time, the eclipse begins before midnight on February 4 and ends in the early morning of February 5. The path of the total phase of this eclipse will cross the North Pacific from eastern Asia to Alaska, where it will end at sunset. The longest duration of the total eclipse will be about 159 seconds. Partial phases of this eclipse will be visible over most of the North Pacific, the eastern part of Asia and western part of the United States and Canada.

On February 20th there will be a partial eclipse of the moon. About 77 hundredths of the moon's diameter will be covered by the earth's shadow at time of greatest eclipse. It will be visible generally in North

d South America, Europe, and the western and central parts of Africa.

There will be an annular eclipse of the sun on gust 1st. The path of the annular phase, within ich the sun will not be completely covered but will pear as a thin ring, or annulus, of light surrounding e moon, lies mostly in the southern part of the Indan Ocean. It barely misses the extreme southwestern int of the Australian coast, and passes over no land cept a small island in the Indian Ocean. The great- duration of the annular phase will be almost seven inutes. There will be partial phases of the eclipse sible in all of Australia and New Zealand, and part the East Indies, so many soldiers will observe it.

On August 15 there will be a rtial eclipse of the moon visible er most of Europe, Africa, Asia d Australia. At greatest eclipse hundredths of the moon's dineter will be covered by the adow of the earth.

Among the planets, Mercury ill be seen to the best advange in the morning sky on—and r a week or ten days before and ter—its greatest western elongaons on February 18, June 18, and ctober 10. It will be seen best in e evening sky on—and for a eek or ten days before and after its greatest eastern elongations n January 8, April 30, August 29, nd December 23. Venus will be in e evening sky from the beginng of the year to September 6, hen it is in inferior conjunction ith the sun and passes from the vening to the morning sky. It will main there for the rest of the ear. Venus will be at greatest ongation east of the sun on ne 28, when it sets more than ur hours after the sun. It will ave its greatest brilliancy in the vening sky on July 31 and again, the morning sky, on October 13. On November 16 enus will reach greatest elongation west of the sun nd will then rise more than four hours before the sun.

Mars will be in opposition to the sun in 1943 on December 5, but will be nearest to the earth on November 28, when it will be a little more than 50,000,000 iles away. Mars starts the year 1943 in the morng sky, and gradually draws farther and farther away om the sun. It is on the meridian at sunrise August 4, and will be visible all night when it is in opposion to the sun on December 5.

Jupiter starts 1943 in Gemini, is visible in the eveing sky, and is in opposition to the sun and visible ll night on January 11. Until March 12, when it is stationary in position, it will retrograde or move westward with respect to the stars. After March 12 it will follow a normal eastward course through the heavens until December 14, when it again starts to retrograde. This apparent halt in the motion of Jupiter, and also at times of other planets, followed by a temporary reversal of direction of motion, is an effect of the motion of the earth in its orbit relative to that of the planet in its orbit. It will occur when the earth, moving more rapidly than the planet, overtakes and passes it so that the planet is apparently moving in the opposite direction with respect to the background of stars. This is just as when one train passes another, the train that is moving more slowly appears to one on the other train to be moving in the opposite direction. On July 30 Jupiter will be in conjunction with the sun and will then pass from the evening to the morning sky. It will be in the constellation of Gemini until about the middle of June when it passes into Cancer. Late in September it will pass from Cancer into Leo, where it will remain until the end of the year. Next to Venus, Jupiter is the brightest of all the planets, except on the rare occasions when Mars is exceptionally close to the earth at its most favorable oppositions.

Saturn is also retrograding, or moving westward with respect to the stars, at the beginning of the year, but becomes stationary in position with respect to the earth on February 6. After that date it resumes its eastward journey, which will continue until October 9, when it again appears stationary in position. It will then, for the remainder of the year, move from east to west, or retrograde. Saturn will start the year in the constellation of Taurus, where it will remain until fall, when it briefly crosses into Orion, returning, as it moves westward again with respect to stars, into Taurus for the rest of the year. It was in opposition to the sun early in December, 1942, and will remain in the evening sky until June 7 when it will pass to the morning sky at the time of its conjunction with the sun. It will be in fine position for observation in the evening during the winter and summer months as it is far north and the opening of its rings is nearing a maximum. Saturn will again be in opposition to the sun on December 16, when it will be visible from sunset to sunrise. In brightness Saturn will slightly surpass Vega, Capella and Rigel early in the year and in the late fall, and will be equal or slightly less bright the rest of the year.

Thy Stars

By WINIFRED WATERS HUBBELL

At night, from my high window seat
Where hangs the spangled sky,
I watch the mighty cavalcade
Of stars pass slowly by.

The seven Sisters, pale with grief,
Go down the endless years.
Beside his Master, belted bright,
The faithful Hound uprears.

Antares and Aldebaran,
The Archer with his bow,
Great Sirius in midnight sky,
Arcturus swinging low,

The planets wheeling on their course,
And all the shining train—
What fullness they have giv'n to joy!
What surcease lent to pain!

And when my flesh has gone to earth,
A boon I ask, Most High.
Somewhere, somehow, may I still see
Thy stars sweep down the sky.

The School Page

By E. LAURENCE PALMER

Professor of Rural Education, Cornell University, and Director of Nature Education, The American Nature Association

THE NATURE TEACHER AND THIS NEW YEAR

FAR out in the Pacific, far across the Atlantic; high in the air, deep in the sea; empire building, empire destroying; Republican, Democrat; sink them, save them; kill them, heal them; build up reserves, destroy reserves; spend, save; believe, doubt; pity, hate; lead, drive; capture and free. These are but a few of the conflicting appeals to our interest as we change the calendars on our walls. Where does the Nature teacher fit into this hodge-podge? If we have been in the habit of making decisions, we become confused by lack of opportunity to make these decisions significant in the emergency. If we have been in the habit of leaving the decisions to be made by others, we may question many of those being made for us, and wonder if our fate is in reliable hands. As members of a democracy we feel that each of us has a responsibility in the development of things. As members of a nation at war, we realize that it is just that our leaders must of necessity keep important facts from the public if the enemy is to be dealt with wisely. How can we in these times make the necessary adjustments between all of these conflicting issues?

We read in popular magazines that glorious victories are being won; that the "flag still flies". We are shown pictures of a flag being raised "at reveille" amid the bursting of bombs and are told that these are "official" photographs taken at a place where in June the sun rises around 4 A.M. Being trained in science we look at the shadows and find them shorter than the flag pole, even less than half the height of the pole. This tells us that in the place where the picture was reported to have been taken the picture probably was taken between 10 A.M. and 2 P.M. We remember that reveille was not sounded at those hours when we were in service in the last war and we wonder what is wrong. Maybe we should not question even evidence supplied us by the sun and the shadows poles make. We look up this matter of flags and find that "except over three buildings, the flag should be displayed only from sunrise to sunset, or between such hours as may be designated by proper authority". Then we rise at the national anthem and sing about seeing "by the dawn's early light what so proudly we hailed at the twilight's last gleaming". We say to ourselves that if the flag flew through the night on a fort at Baltimore when the nation was young why should it not fly over a military outpost in the Pacific when the nation is mature?

Treading on Rattlesnakes

While looking up this flag business, we come across the item that the first American flag bore a rattlesnake with the words beneath it "Don't tread on me". Then we remember that when we declared war on Germany and Japan we did it to stamp out the "rattlesnakes" and we wonder why, if we considered ourselves as rattlesnakes when the nation was born, we should designate as rattlesnakes enemies who attack us now.

In our confusion, we pick up our selective service blank. We say to ourselves that here at last is a place where we can get into the fight, that at last we can sink our teeth into something tangible. We know that more intensive teaching is being done to train people in the fields of science than ever before in our history, and we are sure that a teacher can help in that work. We look in vain through three or four columns of fine print listing those whose services are needed in the war effort and not once do we find the term "teacher". By this time we are pretty thoroughly discouraged.

In this indigo mood we get on a train. Down the aisle comes a former student erect in a new uniform. We remember how outspoken against war he was a year ago, how he resented submitting to authority and despised everything that had to do with war. He sits down and begins to talk. He is not the same man. He tells us what a wonderful experience he is having. He says that he believes all young men should have at least a year's experience in the army. He tells of how much use he has found a certain course that we practically forced him to take a few years back. When he comes out with the statement that he hopes he will be sent to the front a long way from home we know that all the worrying we did about flags, reveilles and rattlesnakes was just so much wasted time. A few weeks later he writes that he is supervising the water supply for a huge camp, glorying in the Nature experiences he is having and sharing them with us. We know that he is not polishing the apple because he has finished his pursuit of degrees and grades and is pursuing much more important things, and best of all asking our help in that pursuit.

Nature Knowledge Helps

The next day a mediocre student who managed to get through a course in field natural history writes that he has become a qualified weather observer. Another writes that he is piloting a ship in a convoy. Another, who took trigonometry under protest, is the navigator on an airplane. One writes bashfully that he is experimenting eating ants and that he is going to learn as much as he possibly can first hand of the remote combat area he is trying to reach as a private (incidentally he is excellent Ph. D. material). Then we get a letter from a boy who was a bit ashamed of his interest in birds because "he men just weren't that way". He tells of his encounter with a hard-boiled military policeman in Miami when he was using a flashlight at night to investigate the natural history of a Florida front yard during "shore-leave". We can picture him arguing with a petty officer we once knew in defense of something that a few years ago the boy would have ridiculed. We just know that these boys and others will profit by the opportunities of travel that the emergency brings them. Furthermore, we know from what they write that they are helping others live comfortably off the land in remote places.

Then we visit a rural school famed for its interest in camping. Not one of the youngsters has ever slept with nothing between his face and the stars; not a one has cooked a meal without using the orthodox cooking equipment; not a one has eaten a meal gathered from wild sources. When we make them some sumac tea and boil them a mess of lamb's quarters greens using nothing but tin cans and making the fire so that it is invisible from above, so that it boils, bakes and fries simultaneously and uses only a handful of pencil-sized sticks to cook the meal and warm the hands they say, "Why didn't we know this before?" "When can we get some more of this?" and "How soon will you come back?"

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Back from this school visit we find inquiries from three branches of the military service asking for advice on developing equipment designed to keep lost men on the effective list. We hear over the radio that Eddie Rickenbacker and most of his men survived more than three weeks on a raft at sea. We hear of a local boy who twice got out of Germany, once after his bomber was shot down behind the lines. Then we realize that all around us are boys who in a few months may find themselves in a jungle, on the ice, at sea on a raft all alone and completely on their own. We know that we can give them something to help meet this situation. Reveille, flags and rattlesnakes and even selective service blanks fade from our sight.

We may make no splurge, or get any badge, arm band or cocky hat. So what? There is that evidence in letters from boys we know that our training in natural history is helping them. There are those youngsters who are not yet eighteen who are clamoring for more and more and more. There are those who may read this page who can begin to help the boys of their neighborhood as I am trying to help those in mine. Politics, economics, race and petty criticism go out the window. A year of opportunity lies before us. We hope the like of it will never come again. We can and will make the nice adjustment that will bring to focus the reserve of the cynic, the skepticism of the scientist, the faith of the protagonist and the desire to serve of the teacher. We just will not stumble our way through this mess. We will fight our way through.

God and the Universe

Our Palace Wonderful. By Rev. Frederick A. Houck. St. Louis. 1942. B. Herder Book Company. 180 pages. Illustrated. $1.25.

This is a revised and enlarged edition of a book discussing man's place in visible creation, or in relation to the world of God and Nature. The Reverend Houck disposes in his first chapter of agnosticism, materialism and pantheism, and then presents his interpretation of relationships between the mineral kingdom, the vegetable kingdom, man and God. It is an interesting and provocative discussion, the details of which we have not the space to consider at the length that would be necessary. It will be sufficient to say that it would do a lot of people a lot of good to read this book, if only because it would set them thinking.

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Good Advice

W. Scott Lewis of Hollywood, California, deals in minerals. This we gather from a half-dozen mimeographed pages entitled *Mineral Bulletin* that he sends us. But this is no price list of available minerals. It is a refreshing compound of personal philosophy and mineralogical history, with here and there such crass things as prices. Mr. Lewis starts his little publication for October, 1942, with four paragraphs under the heading "Nature Is Still at Peace." This is too good to be confined to the happy recipients of his regular mailing. He writes:

"The police in a leading American city have been instructed to keep their tempers when dealing with the public and to ignore the heated, sarcastic and otherwise sulphurous remarks of those upon whom they bestow tickets and other attentions. People, they are told, are under such a strain as a result of the war that their nervous condition leads to short tempers. If the strain is already beginning to tell, one wonders what the result will be as the months pass and the pressure becomes greater.

"The human nervous system was constructed for a life close to nature and the farther we depart from a natural life the harder it is to retain perfect mental poise. We are awakened in the morning by the jangle of an alarm clock instead of by the singing of the birds. We hastily swallow our breakfast while reading the latest bad news in the paper or listening to it over the radio. We go to work in a crowded car or bus and spend the day doing things we don't like. We come home dead tired and 'rest up' by going to a movie that was designed to put one under an emotional strain that is harmful. When Sunday comes we stay at home from church to sleep or perhaps because our particular church fails to meet our mental and spiritual needs for some reason.

"We are under a constant strain that lowers our efficiency and often leads to a serious breakdown and sometimes even to insanity. This strain has been greatly increased by the war with the result that our efficiency tends to decrease at the very time when the country needs our best efforts.

"The remedy seems obvious. If we are suffering because our lives are unnatural and over-complex, we should seize every opportunity to turn to nature and the out of doors. Nature is still at peace and that peace will flow into our minds and souls if we will give it a chance. Even an aimless walk through the woods is helpful but the effect is much better when we become interested in the study of rocks, birds, flowers, trees and insects. This is especially true now that we are limited in the distance to which we can go. The broader our interests the more we will find in a small area. We have been photographing strange monsters in our own back yard and you would be surprised if you could see some of the results. The hunting has been good and not at all affected by war time restrictions. We find the geology of our local mountains most interesting and while we are studying it we can also be working on the native compositae. Plenty to do? We'll say there is!"

Girl Scouts and Fag Bags

Started successfully on the Pacific Coast last year, a Fag Bag project has been given national emphasis by the Girl Scouts. A Fag Bag is a little red bag carrying a sticker showing a grimacing Jap gloating over destruction of our forests and reminding the holder that "Careless Matches Aid the Axis." Cigarets and matches are supposed to go into the bag, the use of which outdoors is a constant reminder that the unextinguished match or cigaret can greatly damage our forest resources. These bags, made by the members of Girl Scout groups from coast to coast, are being distributed to the forest-going public through United States Forest Service personnel, and through the employees of State forestry departments. Above, Florida Girl Scouts, represented by Jenalee Moore, Phoebe Ryerson and Janice Malsberger, are presenting some of the more than three thousand bags they have made to State Forester H. J. Malsberger for Florida use.

Highway Fatalities

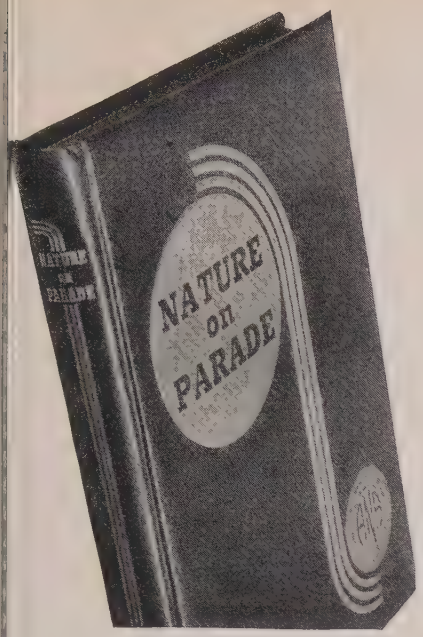
In our November issue in th "Contents Noted" section we di cussed highway fatalities to wil life, asserting that "nobody has a tempted anything like an accura count of the assorted birds an small mammals that have falle victim to the speeding automobile Mr. O. A. Stevens of the Inlan Bird Banding Association takes u gently to task, pointing out th many such counts have been r ported during the past decade i the pages of *Science* and the *Wilso Bulletin*. We have seen these, an they have been excellent and pain taking pieces of work. Perhaps w should have been a little more sp cific and said that we feel that n real attempt has been made to c ordinate information thus far gat ered with a view to presenting a accurate picture of highway loss of wildlife on a national basis.

City and County Parks

With travel restricted by the e igencies of war, local recreation facilities loom in importance for a ever larger number of peopl Therefore the publication of *Mun cipal and County Parks in th United States*, a report of a stud conducted by the National Par Service, with the cooperation of th American Institute of Park Exec tives and the National Recreatio Association, is particularly timel This 174-page booklet, availabl from the National Recreation Ass ciation, 315 Fourth Avenue, Ne York, is a factual and statistic picture of the situation and im mensely valuable to all concerne with this work. The study was ca ried on under the direction George D. Butler.

Michigan Plants

A graphic picture of Michiga plant life is to be seen at the Cra brook Institute of Science, Bloom field Hills, Michigan, in the r cently-completed Hall of Michiga Plant Associations. This exhibit unique in that it shows the princ pal plant associations of a Stat with the successional communiti leading toward them. The story told through three-dimensional d oramas of seven of the State's mo outstanding plant communitie These range over seven degrees latitude and eight of longitude, an cover a diversity of terrain and ve etational types. The Novembe 1942, *News-Letter* of the Institu describes in detail the exhibit



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Waltonian Meeting

Rightly convinced that conservation of the nation's natural resources is a vital question in time of war, the Izaak Walton League of America has announced that it will not forego its annual conventions for the duration. The 21st annual meeting will be held in Chicago on March 25 to 27, 1943. In announcing this decision, the officers of the League declare that to do away with the convention "would greatly hinder the patriotic services the League is rendering today."

Cornell Leaflet

The Cornell Rural School Leaflet for September, 1942, is the annual Teachers' Number. It is a unique one in this valuable series of leaflets. E. Laurence Palmer has chosen to present the story of conservation in a series of simple cartoons that combine humor with "punch". The illustrations are accompanied by concise text suggestive to the teacher. One value of these cartoons is that they may serve as ideas for students in executing some of their own, thus putting into tangible form the lessons of conservation.

Heads Ornithologists

James L. Peters of New York City was elected president of the American Ornithologists' Union at its annual meeting in Philadelphia. George Willett of Los Angeles and Hoyes Lloyd of Ottawa, Canada, were chosen as vice-presidents. Lawrence E. Hicks of Ohio State University at Columbus was elected secretary. The Brewster Medal award was made to Margaret M. Nice of Chicago for her publication on "The Life History of the Song Sparrow." The 1943 meeting will be held in New York, conditions permitting.

Non-Theatrical Films

1000 and One. Chicago. 1942. The Educational Screen. 132 pages. 75 cents.

This is the 18th annual edition of this very useful listing of non-theatrical films available on various bases for school, home, club or other use. Anyone concerned with providing educational motion pictures for groups of any sort, or pictures for special entertainment, could hardly do without it.

Your Garden Bookshelf

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(Continued from page 34)

bombings. The first destroyed the engraving plant and all the cuts for the book, and after new photographs had been sent from America a second bombing destroyed the work in the publisher's bindery, and made a third attempt necessary for its final publication. *Grassroot Jungles* has been translated by the Library of Congress into Braille, and it, too, has been published in London.

The fact is that all four of Mr. Teale's major works are of outstanding intrinsic merit, as readers of this magazine may know through the reviews that have appeared upon publication and through the chapters in them that have first been articles in this magazine. The further significance at this moment is in the suggestion that together these works indicate the importance of an author yet young from whom much should be expected—and demanded.

Quite separate from these considerations are the more than four hundred superb photographs reproduced in the four books here discussed. Independent yet interdependent, as one might say, Mr. Teale's writings and photographs are apparently related in a most interesting way. As a writer Mr. Teale is enlarging his reach in a profession that he followed for thirteen years as a feature writer on many subjects. As a photographer he sought out one of the byways he has since recommended to others. Following this avocational trail of photography he has found his most significant vocational achievement as a writer. It is a rare good fortune that a volume can be both so well written and so well illustrated, but the interest in the photographs, which has undoubtedly been dominant, should not be allowed to obscure the fact that this artist with a camera is still more important as a writer.

"As a boy on an Indiana farm," wrote Mr. Teale once in a personal letter, "close to the Lake Michigan sand dunes, I used to spend winter evenings poring over an ancient copy of Frye's geography and a Sears Roebuck catalog—planning far voyages. I made out long lists of equipment and camping supplies. But I never was able to go. Keeping the machinery of life running took all the time during later years. So I have had to explore at home."

This winter Mr. Teale, the explorer at home, was asked to lecture on his adventures before the noted Explorers Club in New York City, and the Clark H. Getts Lecture Bureau has recently signed him up for a lecture tour next spring. The experiences and reflections of such an explorer—in realms much less familiar than the reaches of geography and perhaps much more important—are the materials of great literature, and we may well wish for Mr. Teale an ample scope for its creation.

Data regarding these books by Edwin Way Teale, all published by Dodd, Mead & Company, New York, are as follows:

Near Horizons: The Story of an Insect Garden. 1942. 319 pp., with 160 photographs, an "entomological epilogue" listing scientific names of insects mentioned, and an index. $3.75.

Byways to Adventure: A Guide to Nature Hobbies. 1942. 222 pp., with 15 photographs and a montage, numerous bibliographies, and index. $2.75.

The Golden Throng: A Book About Bees. 1940. 207 pp., with 85 photographs, "photographic postscript," bibliography, and index. $3.

Grassroot Jungles: A Book of Insects. 1937. 238 pp., with 130 photographs, bibliography, and index. $3.75.

Frogs and Toads

Handbook of Frogs and Toads. By Anna Allen Wright and Albert Hazen Wright. Ithaca, N. Y. 1942. Comstock Publishing Company. 286 pages. Illustrated. $3.00.

This is a new and revised edition of a book that was immensely valuable and actively welcomed when first published in 1933. It is fully as valuable and welcome today. Prepared to be of practical use to teacher, student and naturalist, it is unsurpassed in its field. It is the sort of book that—when we receive an inquiry for a frog and toad book—we recommend without qualification and without alternative suggestion. Briefly it provides accounts of the appearance, range, habitat, life history, and such, of 98 species and sub-species of the frogs and toads of the United States and Canada.

Ornamental Shrubs

Ornamental American Shrubs. By William R. Van Dersal. New York. 1942. Oxford University Press. 288 pages. Illustrated. $4.00.

This book presents an extremely interesting approach to the subject of its title. Perhaps few realize that when the North American continent was first explored many seeds and plants of native shrubs were collected by the plant explorers of the day. These were planted in quantity in European gardens, where they became among the most admired of plants. Yet to this day many of these same shrubs have been largely neglected in our own home plantings. Mr. Van Dersal in his book, therefore, sketches this interesting background, and then proceeds to a discussion of the American ornamentals from the horticultural viewpoint. The result is both an interesting and practical book.

Our Forests

American Forests. Washington, D. C. 1942. American Forest Products Industries. 48 pages. Illustrated. Free.

This booklet is prepared to tell simply and graphically the story of our forests and the vital part they play in our national economy. It is intended primarily for school use and as such is available to teachers and schools. It is offered also to other interested inquirers who can use it effectively to further the educational purpose for which it is published. It takes the place of the *Forestry Primer,* published by the late Charles Lathrop Pack and in the past distributed by the millions to schools.

For the Younger Set

Five recent books from the presses of the John C. Winston Company of Philadelphia have a definite appeal to the younger set and all have a particular Nature interest. *Trailer Trio* by Emma Atkins Jacobs is the story of three youngsters in a trailer, their adventures on a trip in the West. *When the Typhoon Blows* by Elizabeth Foreman Lewis is a story against the background of a China fighting for freedom. *Spike of Swift River* by Jack O'Brien is a story of a dog, mistreated by man, struggling for existence in the wild. *Story Parade* is a collection of modern stories for boys and girls. *The Perilous Island* by Frederic Arnold Kummer is a timely story of mystery in the Aleutians complicated by war. All of these books are well illustrated and each one sells for two dollars. They offer a solution of the problem of what to give son or daughter, nephew or niece, or a friend.

As a convenience to readers the books reviewed in the pages of Nature Magazine may be ordered through the book department of the American Nature Association, 1214 16th St., Washington, D. C.

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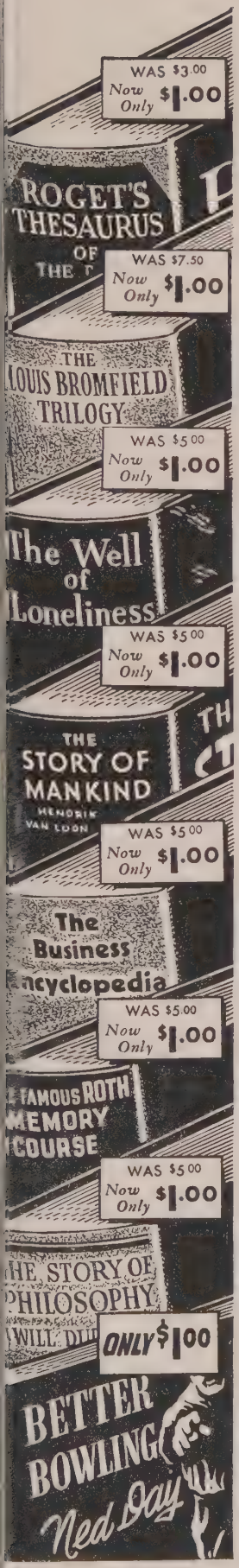

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Beulah was born in Hollywood while Elsie was there to fill an important motion picture engagement. The little newcomer is appropriately christened with milk from a child's watering pot while mother proudly watches the ceremony.

THE BOVINE GLAMOUR GIRL

(Continued from page 24)

through New York she stopped off at Bonwit Teller's on Fifth Avenue for a shopping tour. After a good rest she spent the holiday season at Gimbel's in Philadelphia. There 288,000 people came to see her, giving Santa Claus tough competition.

After the first of the year, with a collapsible paneled boudoir, a new set of furniture and a wardrobe trunk to hold her hats, wreaths, blankets and toilet accessories, she started traveling again. "She," in this case, is used collectively. Elsie had so many engagements that just one cow could not handle them all. Other Jerseys of approximately the same color, appearance and disposition were added to the troupe and were used alternately with Lobelia. Two Elsies were never going at the same time, but the use of more than one cow enabled long rests between trips and shows, and allowed breeding and calving to proceed in a normal way.

Then a tragedy occurred. You'll Do Lobelia was badly hurt when the van in which she was riding was smashed into by a heavy tank truck. Specialists from the Pennsylvania School of Veterinary Medicine were called in for consultation, but in spite of anything anybody could do, she died. All who had had anything to do with Elsie were prostrated because they genuinely loved Lobelia. The public apparently felt the same way, for immediately after the news broke in the press and over the air, wires and letters of condolence poured in. Even flowers were sent. Press clippings came in from all over the country, and the burden of them all was that Elsie was dead.

So the whole affair seemed about to collapse. How could it be explained that Elsie was a picture before she was a cow; that other cows were playing the rôle; that L'Aiglon did not die with Bernhardt; that Elsie and Alice and Peter Pan were cut from the same cloth of fantasy?

Evidently no explanation was needed. Within a few weeks, Atlantic City wrote and asked for an Elsie. The Canadian National Exposition wanted her; the New York State Fair wanted her, as did Massachusetts and New Jersey. These engagements were filled by the other purebred Jerseys—Noble Aim Standard, Surville Wonderful Lady, Noblette Cymbeline—and the show went on.

In Canada, for example, Elsie played to 250,000 people and collected $20,000 for the British War Victims Fund. Last December she gave a return performance at Gimbel's in Philadelphia and nearly doubled her first year's attendance. In all more than three million people have come to look at her since she left the World's Fair.

Her effigy—like that of Mickey Mouse—is quite apt to greet you in stores in the form of games, dolls, cream pitchers, soap and handkerchiefs. A charming children's book about her titled simply "Elsie, The Cow" is currently on sale in book shops.

Elsie was booked solid through 1942. Her boudoir has been redecorated with red, white and blue draperies and bespangled cushions. She has a bucket of sand and a hoe and a shovel—against air raids—and favors the jet rather than the spray method for dousing incendiaries. From someone in Elmer's family she has procured a Kentucky flintlock rifle, which stands between the door and the window in case of Japs or Nazis. Practically all of her appearances now are for War Bonds, or the USO or the Red Cross.

That is the story of Elsie, the Cow. The public, out of its affection for friendly animals, brought her to life. Her fans would not let her die. Even those who know her best do not quite understand her continuing and growing popularity. Presumably that is Elsie's secret, and she will not tell.

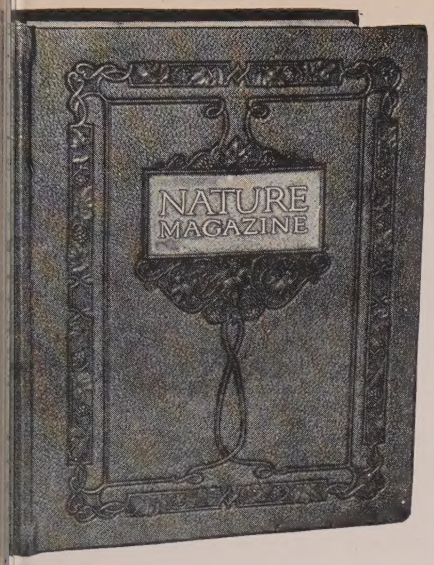
•

SASSAFRAS TEA

(Continued from page 14)

tion of only the most delicate and pleasurable qualities of its base. Making tea is a superficial and fleeting operation. The steeping should continue only long enough to sample the fragrant and palatable ingredients; for to try to exhaust them brings along other elements that destroy delicacy. For the China product, a few swishes of the tea ball—a matter of moments—will serve. For sassafras, with its virtues more firmly imprisoned in woody substance, a few minutes are required. The secret, in any case, is to capture the aroma and flavor, but to stop short of extraction of pucker, bitterness, or bite. Thus prepared, sassafras tea, with the addition of enough sugar to combine in the most savory proportion with its essence, is the equal of any on earth and, to its devotees, seems full as praiseworthy as the fabled nectar of the gods.

After painful boyhood experience with the brew, how did I become a worshipper of the tea? It



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happened at college in the room of Victor Barnett, son of the people. He, country-wise, provided the tea and I, mostly town-bred, brought cup cakes of a crisp goodness found only then and there, despite the subsequent two-score years of searching. The tea was made in a tin can on a small wood-burning stove such as so many of us depended upon for winter warming in the single rooms that held all we knew of home comforts during our student days.

United by love of Nature, especially of birds, Vic and I discussed our sciences and speculated on the verities of life upon which, even as university "men," we were barely entering. It was high thinking and pure disinterested friendship at its best. Pleasant warmth, subdued light, relished food, and delicious drink gave us, despite our lack of coin, all of the creature gratification the rich can enjoy. We were pleased and gave pleasure; converse and comestibles were in high accord.

Since those nights, sassafras tea has been sacred to me. Herb women of the markets keep me supplied with the bark of the roots, only from which can the tea be properly made. The bark must be thoroughly dried for keeping and stored in tight containers. When I open one of these, the burst of lovely fragrance, more often than not, brings tears to my eyes from sheer nostalgia for the days that were but can never be again.

Violets

Wild Violets of North America. By Viola Brainerd Baird. Berkeley and Los Angeles. 1942. University of California Press. 225 pages. 80 plates in full color. $10.00.

This is a beautiful and notable book. Everyone who loves violets will want a copy. The title is descriptive of the contents up to a certain point, but it cannot describe the beautiful color reproductions of the pictures of the violets, done by F. Schuyler Mathews, that accompany the text by Mrs. Baird. This text is a happy and unusual combination of botanical information and charming description, revealing the author to be a lover of violets herself. The edition of this book is limited to one thousand copies, and even at ten dollars a copy we do not see just how the University of California Press has been able to make available a book with so much color illustration. In any event, wildflower lovers are in debt to the publishers, author and artist for it.

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Under the Microscope

By JULIAN D. CORRINGTON

BIRD BROWNIES

"Willie," said the teacher, "there are two words that I don't want to hear you use any more! One of them is swell and the other is lousy!"

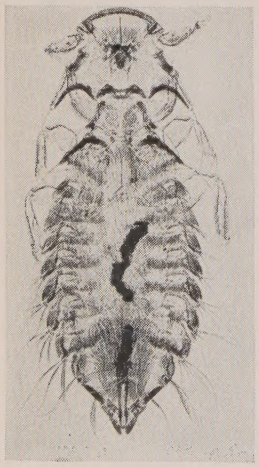
"O. K., teacher," replied the obliging pupil, "what are the two words?"

Some time ago in our subdepartment, *Beginner's Primer*, we passed by the Orders Mallophaga and Anoplura in our survey of insects, with the remark that they were of such general interest to all microscopists that they would be treated as feature articles in the months to come. And so here we are, coming up with a "swell" but lousy subject.

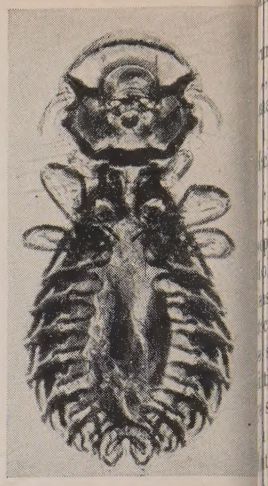
The word louse has been applied to aphids, often called plant lice; to a small group known as bark lice; and to certain wingless and highly modified flies, as the bee louse and sheep louse. Its proper usage, however, is restricted to members of the two orders here introduced. The Mallophaga are the bird lice or biting lice, while the Anoplura are called the sucking or true lice. The two orders are readily told apart; the bird lice have a broad head with mandibulate (biting) mouthparts on the under surface; the true lice have a narrow head with piercing-sucking mouthparts at the anterior end. Both groups are wingless, have no ocelli or cerci, and exhibit incomplete metamorphosis, the young resembling the parents. More about the Anoplura in a later article.

Slender pigeon louse, *Columbicola columbae*

While the Mallophaga are called bird lice for the reason that most species infest birds, there are many forms on mammals also; on the other hand, all lice on birds are mallophagans. The word means wool-eater, in reference to the feeding habits, and indicates a mammalian host for one of the earlier known species. Living next to the skin of their unfortunate victims, these small insects nibble at the scurf skin and at hair, feathers, and the dried blood collecting around wounds made by the host in scratching the irritated parts. Wilson observed that the body louse of the hen sometimes bites into the live and soft bases of feather quills and dines on the fresh blood thus obtained, but it is not known how general this habit may be; usually it has been assumed that the injury to hosts consisted mainly in irritation, becoming so great and constant when the parasites are present in large numbers as to bring on serious nervous disorders or even death. It is to free themselves of these pests that birds give themselves dust baths.



Large turkey louse, *Goniodes meleagridis*



Large chicken louse *Goniocotes gigas.*

The various species of bird lice are often grotesque and amusing in appearance and of suitable size to provide most interesting mounts for the microscope, usually best when potashed. They range from about $\frac{1}{25}$ to $\frac{1}{5}$ of an inch in length, and from white through yellow, tan, brown, dark red, to almost black in color, with or without pattern markings. Some are swift runners, skiddling nimbly through the vast forest of feathers or hair in which they dwell; others are sluggish and spend most of their time clinging. Much reduced compound eyes are situated on the sides of the head, and the antennae are short, either filiform or clubbed, two- to five-segmented and either free or concealed within a groove on the ventral side of the head alongside the mouthparts. The legs are short and stout in some, fairly long and slender in others; the tarsus has one or two segments, and there are either no claws or one in most species infesting mammals or two in bird-inhabiting lice.

The barnyard biddy provides a most fertile hunting ground, while her frequent consorts—ducks, turkeys, and pigeons—do not escape the attentions of such ubiquitous vermin. Some species of lice can attack several host species but, as a general rule, each type of louse has a particular species of bird to which it confines its ministrations. Wild birds are usually infested and the largest lice we have seen were obtained from a sick bald eagle we once encountered. Whole families and generations of lice inhabit a given host, the females laying elongated eggs, termed nits, that are glued to the feathers or hair of the victim. Broods overlap, there being several to many generations a year, and soon the host becomes heavily infested. The young resemble the parents and grow rapidly, the conditions being ideal since they are protected and supplied with uniform body heat from the host. Lice do not live long when removed from a warm-blooded host, hence contaminations have to be spread by contact or from nests and roosts frequented by several birds of the same species.

Some of the well-known forms attacking domestic animals include *Menopon biseriatum*, the large body louse of poultry; *M. pallidum*, the shaft louse or small body louse of poultry that sometimes transfers its attentions to horses; *Goniocotes gigas*, large chicken louse; *G. hologaster*, the chicken fluff louse; *G. compar*, broad pigeon louse; *Columbicola columbae*, the slender pigeon louse; *Lipeurus polytrapezius*, slender turkey louse; *Goniodes meleagridis*, large turkey louse; *Bovicula bovis*, the biting cattle louse; *Trichodectes equi*, *T. ovis*, *T. canis*, chewing lice respectively of the horse, sheep, and dog; and *T. scalaris*, the chewing cattle louse or little red louse. Some of these wil

k man when they get upon accidentally, as when the ral hosts are cleaned or han-, but there are no specific an lice in this order.

collecting, make a careful h at the base of feathers and , particularly around the head, , armpits, and rump; capture pests with fine forceps and kill lacing in a bottle of alcohol. sh the larger forms, as per ctions in previous articles in series and, during hardening, tion carefully to see that legs symmetrical, not overlapping other or the body, and the thparts displayed. Where pos-, mount two specimens per , one dorsal and the other ven- surface upward. If only one vidual is obtainable, mount ral surface up, to present the thparts. Photomacros of these ns are highly interesting but er difficult, and put the photog-ner on his mettle to get both th and contrast. Bellows and rs are necessary for good shots. after you have a goodly col-on of species of Mallophaga eatly mounted and labeled, in- your canary to inspect them watch him gloat!

LOGICAL LABORATORY NUALS

Botany

ther matters have crowded out series on laboratory manuals e; as we now resume, we find rge family clamoring for our tion. In proportion to the ber of courses taught there ar to be more manuals on ny than for any other sub- Let us have a look at some em.

thin the last two decades the hasis has been shifted from ght morphological and sys-atic description to experiment, ssing the physiological and ogical aspects of the living t. Some authors prefer the ll, printed, bound volume; rs the large, notebook-style, tigraphed or mimeographed ual. Some require many draw-, completely designed by the dent; others include many pre-d drawings and diagrams, ch the students are to complete, perhaps merely to label and , with the idea of saving labo-ry time and deëmphasizing the ing of drawings. The relative its of these two systems com-e a debatable question in the ds of educators, each with its ponents. The first group to be ussed includes six of the older type; small, printed, bound, and without drawings to be labeled.

Laboratory Botany, by William H. Brown, has an introduction on methods, then the plant as a whole is considered, followed by work on the microscope, cells, and experiments on cell physiology. A detailed study of plant parts is then followed by a survey of the plant kingdom, a statement true of all manuals here considered, the first semester of work comprising a type study of flowering plants, the second a kingdom survey in evolutionary sequence. Each of the 185 exercises is designated as a drawing, observation, problem, or experiment, and is well chosen to provide comprehensive training. Numerous tables are included, to be filled out by the student. Pp. xiv, 168; figs. 29. Ginn & Co., 70 Fifth Ave., New York, 1925. $1.20.

Edmund W. Sinnott, well-known author of texts in botany and genetics, presents a brief work of 92 exercises in his *Laboratory Manual for Elementary Botany*. After a list of suggestions to the student, work commences with a study of the soil, then the root, including cells and their physiology; then the leaf, stem, metabolism, growth, ecology, reproduction, and heredity; followed by the second part on plant types. Morphological description is pared to a minimum, most of the space being taken up with stimulating questions. Of the 69 exercises preceding the survey of plant groups, 45 are experiments; thus the book has been made as completely experimental as possible. It will thus serve well for classroom instruction, as intended, but would not be of sufficient help for the independent amateur, who will need fuller descriptive information. Pp. ix, 106. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, 1927. $1.00.

A compact, well-written, and thoroughly workable guide is Arthur T. Evans' *A Laboratory Manual for First Course in Botany*. The introduction includes some excellent help for the student in keeping a suitable notebook, with specimens of first-class work, then follows a chapter on general science, with studies on oxygen, carbon, carbon dioxide, nitrogen, solutions, diffusion, and osmosis as preliminaries. Work on plants begins with cells and tissues, as parenchyma, starch, stone tissue, epidermal cells and hairs, mitosis, and vascular tissue. Plant parts and their physiological processes are taken up at length, after which is a chapter on ecology, one on weeds, then a brief survey of the plant

Background for the Microscope

Equipment for the pursuit of microscopy may be as simple or as elaborate as individual inclinations dictate; but there is one item wholly indispensable —*books!* The microscope is handmaiden to all the sciences, and those who follow its adventuresome trail must have many a guide to direct along the right path.

Here is NATURE MAGAZINE'S selection of best bets. Check your library and add those who fail to answer the roll call. Buy one each month, or as often as you can. Suggest them as gifts. Buy them for the relative or friend whose chief joy is working with his microscope. Entries will be changed periodically; here is a basic list for a starter:—

MICROSCOPE

The Microscope, by S. H. Gage; 17th ed., most celebrated American work; very thorough.....$4.00

The Microscope, by R. M. Allen; Excellent new manual.....$3.00

MICROTECHNIQUE

Working with the Microscope, by J. D. Corrington; New guide for self help or classroom with graded series of lessons, from single to advanced. $3.50

Adventures with the Microscope, by J. D. Corrington; An informative and interesting text for the younger hobbiest or biological student.....$5.00

Animal Micrology, by M. F. Guyer; Best general guide for histology and zoology at the college level.....$2.50

The Microtomist's Vade-Mecum, by A. B. Lee; Encyclopaedic reference, standard, advanced; botany and zoology. $9.00

PHOTOMICROGRAPHY

Photomicrography, by R. M. Allen; Splendid new work by recognized authority; complete; fully illustrated. $5.50

BOTANY

Textbook of Botany, by Transeau-Sampson-Tiffany. Beautifully designed, readable, recent.....$4.00

ZOOLOGY

College Zoology, by R. W. Hegner. Fifth Edition; most successful work of its kind; gives all main animal types and their structure.....$3.75

Animals Without Backbones, by R. Buchsbaum. Fascinatingly written and illustrated; new style invertebrate zoology.....$5.00

Man and the Vertebrates, by A. S. Romer. Companion volume to preceding; excellent general survey. $4.50

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kingdom. The work ends with chapters on plant breeding, plant diseases, and economic botany. Exercises total 111. Pp. ix, 155; figs., frontispiece, 49. Ginn & Co., 70 Fifth Ave., New York, 1928. $0.84.

An excellent, condensed manual is the 4th edition of *A Laboratory Guide for a Course in General Botany*, by Bonar, Roush, and Holman. Here the work is not divided into exercises or chapters, but topics are set off by distinctive type. Each main subject begins with a short description, then comes a reading assignment, material for study, directions for work, and it ends with a list of review questions. Directions to the student and a list of reference works precede a study of the plant body, plant cells, tissues, and organs. Following the systematic account are a comprehensive appendix on methods and a glossary. The directions are somewhat more in detail than in manuals previously mentioned, and the organization is such as to facilitate mastery of the subject by the independent worker. Pp. xvii, 110; fig. 1. John Wiley & Sons, Inc., 440 Fourth Ave., New York, 1938. $1.25.

Fisk and Addoms present a succinct and workable guide in *A Laboratory Manual of General Botany*, arranged as 44 exercises, with an appendix of 44 additional exercises on methods. After a foreword to students, the plant body is considered, then cells, plant parts, and plant physiology. The second half, surveying the plant kingdom, is, contrary to the other manuals here discussed, more extensive than the first part, and considers all principal types in what appeals to us as more satisfying detail. Under each topic, following descriptions and directions for drawings, appears a small section calling for written notes from the student. This manual is unusually well written. Pp. x, 137. The Macmillan Co., 60 Fifth Ave., New York, 1939. $1.10.

Detailed instructions, telling the student exactly what to do and how to do it, characterize the 2d edition of *Instructions for Laboratory Work in General Botany*, by Rickett and Naylor. The 36 sections each include references and materials, and there are frequent outline drawings to assist in identification of parts, and several tables to fill in. Another distinctive feature is that the general instructions to students as to making drawings, reporting experiments, using the microscope, and the like, are interlarded, appearing when the subject first comes up, rather than all being assembled as a preliminary chapter. This device will insure the reading of this often neglected material. Work starts with the seed and seedling, then cells, plant parts, and physiology. Approximately an even distribution is maintained between structural and descriptive botany. Pp. 162, figs. 13. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, 1939. $1.25.

In the next installment of this series we shall discuss three of the newer or workbook type of manual.

TRADE NOTES

The Bausch & Lomb Optical Company, Rochester, N. Y., have sent us an additional supply of four of their principal catalogs, previously advertised for distribution in these columns. The titles are: Medical Microscopes and Accessories; Magnifiers and Reader
Microscope Accessories; and Laboratory Microscop
Types A-B-C. Readers who missed the former oppo
tunity to secure copies of these useful and beautiful
illustrated catalogs may now request them. Send a
stamp for each catalog wanted, stating the title
each, to Julian D. Corrington, Nature Magazine, 12
Sixteenth St., N.W., Washington, D. C.

A new sales-service-repairs organization for m
croscopes has been opened at Washington, D. C., o
erated by factory-trained, precision craftsmen, and a
thorized by the Spencer Lens Company. The firm
known as Micro-Mart and the address is 3508 Connec
cut Ave. They have new and rebuilt microscopes f
sale and are qualified to make repairs and adjustmen

Working With the Microscope is the title of a speci
exhibit in Baltimore, arranged by the Marylan
Academy of Sciences. It has interested large numbe
of visitors for the past two months.

"Ah, Epithelia," sighed the weary Wandering Ce
"Epithelia, tis-sue, tis-sue!"

A. S. A. M. NEWS AND NOTES

Five Year Club

Additional recruits since the first list, published
our October issue are: T. A. Allan, Toronto; N. Argu
Annapolis, Md.; J. W. Baechle, Collegeville, Ind
M. L. Bogdonoff, West Hartford, Conn.; W. W. Da
metka, Gardner, Mass.; P. E. Engen, Fullerto
Calif.; F. G. Finger, E. Cleveland, O.; G. M. Garne
Madison, Wis.; M. S. Gendreau, Rochester, N. Y.;
Harvey, Jenkintown, Pa.; F. J. Howe, Rugby, Eng
V. R. Malcolm, Celo, N. C.; W. L. Ogden, Portlan
Ore.; C. Rohrer, Bucoda, Wash.; E. R. Schowalte
Wichita, Kan.; H. M. Smith, Chicago; A. S. Windso
Chicago; S. H. Wolf, Roxbury, Mass.; Mrs. T.
Wolfe, Corsica, Pa.; E. C. Wood, Basking Ridge, N.
Total in Club: 49.

Two New Chapters

The thirteenth or Nu Chapter of the Society h
been founded at Hokendaqua, Pennsylvania, by th
biology instructor, Edgar D. Steckel, for his pupils
Whitehall High School. The charter petition w
signed by eleven new members, and others have sin
joined so that the new Chapter is starting off with
bang. They have chosen the name *The Robert Koc
Chapter* for their organization.

A charter has likewise been granted to the *Nort
Shore Chapter*, at Salem, Massachusetts, founde
through the efforts of Joseph J. Kelley, now H.
1/C, U.S.N.R., Medical Department. Starting with
new members, this group is a live one that expec
to grow rapidly. Mr. Kelley is the President an
Harold O. Conant, 7 Carpenter St., Salem, Mass.,
the Secretary. Members and prospective members
the A.S.A.M. in the Salem district are invited to co
municate with Mr. Conant.

★ ★ ★